

# the Iron Age

A CHILTON

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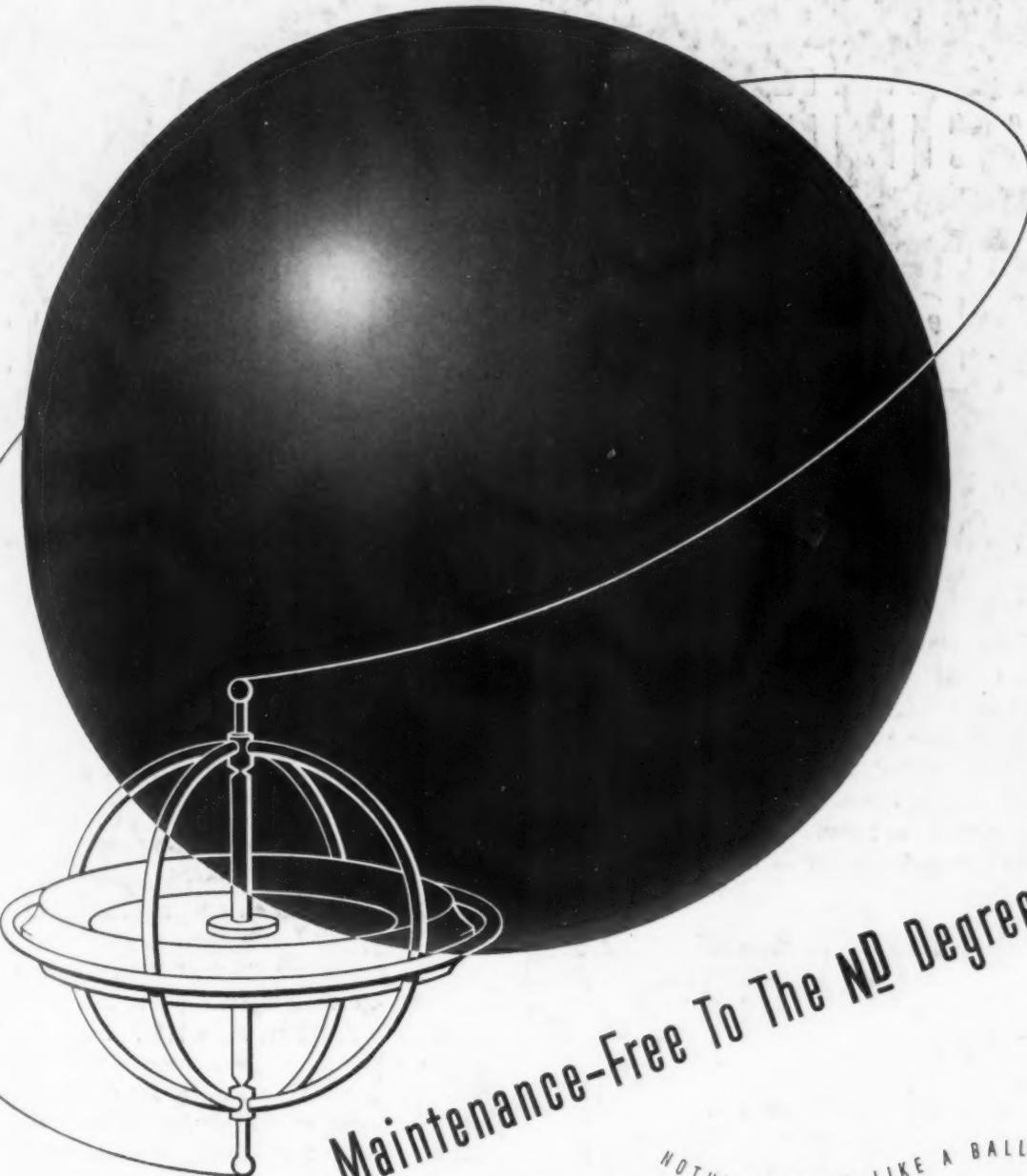
NATIONAL METALWORKING WEEKLY

23 1953

April 23, 1953

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TS PAGE 2



Maintenance-Free To The ND Degree

NOTHING ROLLS LIKE A BALL



**NEW DEPARTURE**  
**BALL BEARINGS**

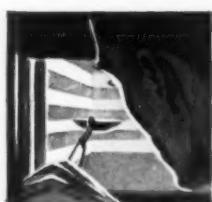
NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT  
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aintenance costs can slash deeply into manufacturing profits. One way to attack this problem is to insist on New Departure ball bearings in production machinery and end products . . . they reduce maintenance just as they reduce friction.

hen, New Departure ball bearings are self-sealed and lubricated-for-life so as to eliminate all bearing maintenance. Machines and motors thus can be placed in almost inaccessible locations without worry about servicing problems.

# How much heat from a "heat" of Chromel

You've seen molten metal before . . . but chances are you've never seen a "heat" that's more closely controlled as to composition and quality than the one you see above. For this is a heat of Hoskins Chromel . . . the *original* nickel-chromium alloy that first made electrical heating practical. Into it go precise amounts of the purest raw materials obtainable . . . mixed, melted, and poured in exactly timed cycles.



Heating elements made of Hoskins Chromel give long life service in industrial electric furnaces, home appliances.



Spark plugs equipped with Hoskins electrode alloys give long dependable service wherever they're used.



Hoskins Chromel-Alumel thermocouple alloys accurately register exhaust temperatures of jet aircraft engines.

And from it, ultimately, will come approximately 1200 pounds of fine finished material . . . smooth, bright, durable wire or ribbon produced to a specified resistivity for long, dependable service as heating elements or cold resistors in countless different electrical devices.

Chromel, however, is only one of many specialized, quality-controlled alloys developed and produced by Hoskins. Others include: Alloy 502 . . . used throughout industry for a wide range of heat resistant mechanical applications. Spark plug electrode alloys . . . which have become universally accepted standards of quality and durability. Alloy 717 . . . used in facing engine valves for longer life and improved service. And, of course, there are Hoskins Chromel-Alumel thermocouple alloys for industrial furnaces and jet engines . . . unconditionally guaranteed to register true temperature-e.m.f. values within close specified limits.

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## Steelwork goes up faster with High-Strength Bolts

To put up steelwork quickly, more and more erectors are using Bethlehem High-Strength Bolts to join the structural members.

Bethlehem High-Strength Bolts save construction time because they can be installed with little effort. They are used with heavy semi-finished nuts, drawn up with power wrenches to make a secure joint.

To assemble Bethlehem High-Strength Bolts, two hardened steel washers are used with each bolt, one

under the head, the other under the nut. This permits the development of maximum clamping force to resist slippage without deforming the connected material.

Bethlehem High-Strength Bolts are used in place of field-driven rivets. They are made at our fasteners plant at Lebanon, Pa., and are carefully heat-treated by quenching and tempering, to meet the requirements of ASTM Specification A-325. They are stocked in a wide range of sizes.

A letter or postcard to the nearest Bethlehem sales office will bring you a copy of our informative booklet, "High-Strength Bolting for Structural Joints," by return mail.

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# Bethlehem supplies every type of Fastener

# The Iron Age

Vol. 171, No. 17, April 23, 1953

\* Starred items are digested at the right.

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# DIGEST of

## NEWS DEVELOPMENTS

### CONTINUOUS CASTING SPELLS INTEGRATION—P. 77

Rapid advancement in continuous casting of aluminum paves the way to integration for small fabricators. For a relatively small capital outlay a firm can produce its own semi-finished material. Machines take little space, can be geared to production needs. New Properzi machine introduced.

### NICKEL CURBS DIM AUTO BRIGHTWORK PICTURE—P. 80

With auto output eating up nickel at a record pace, harassed automotive purchasing agents are hard put to find enough of the metal to reach even the thin thickness permitted by controls on car trim. Many cars are coming off the assembly line with less than the allowed 0.001 in. thickness of nickel.

### DISCOVER PRIME NEW CUBAN NICKEL SOURCE—P. 81

Freeport Sulphur Co. has discovered a 40-million-ton orebody in the Moa Bay area of Cuba. Ore averages 1.35 pct nickel, 0.14 pct cobalt. New find near the Nicaro deposit, climaxes years of exploration. Field will add some 500,000 tons of nickel and 56,000 tons of cobalt to lean U. S. supplies.

### CZECH PLANTS GIVE REDS STRONG ARSENAL—P. 83

Russian control of Czechoslovakia assures Reds of formidable war machinery. Europe's arms specialists since 1919, Czechoslovakia is producing a large variety of weapons for the Russians. Though no Czech arms are known to have been used in Korea, shipments to China have been large.

### ACCIDENT RATES FALL IN PINPOINT PROGRAM—P. 88

Rifle-type sharpshooting is better for hitting safety bullseyes than shotgun tactics. For proof U. S. Steel Corp. points to an accident rate off by nearly 60 pct in 4 years, with lost-time accidents down over 45 pct. Company uses a big management technique to determine accident causes, erase them.

### AUTOMATION TOOLMAKERS' RESPONSIBILITY—P. 107

Machine tool builders must take the initiative in supplying automation equipment, Ford executives say. If builders know that their machines are going to be used in an automated line, they should install automatic loading and unloading devices. Buyers must speed up their replacement of old machinery.

# The Week in Metalworking

## ENGINEERING & PRODUCTION

### HOW TO FABRICATE 430 STAINLESS STEEL—P. 139

If you plan to switch from 302 to 430 stainless, you may have to revise tooling and fabricating procedures. While some parts are easily formed, 430 offers some problems in more complicated shapes. Press-drawn parts need larger blank sizes, higher hold-down pressures, larger radii.

### IT'S WORTH SALVAGING GRINDING WHEELS — P. 143

Chipped or worn grinding wheels can often be salvaged—at a profit—by cutting to useable sizes. Applicable mostly to large wheels, the method uses a lathe equipped with chuck or faceplate. Cutters for the machine are relatively inexpensive and usually size from 3 to 10 wheels.

### UNIFORM ANNEALED GRAIN SIZE IS OBTAINED—P. 144

Radiant-roof burners in a pan-type annealing furnace develop heat patterns to suit the job. Once adjusted, each of 27 burners delivers its proportionate share of heat and compensates for nonuniform heat losses. Reduced gas-air ratios are constant and accurately mixed to minimize oxidation.

### TESTS SUGGEST ERROR IN POISSON'S RATIO—P. 148

Tests at Oak Ridge National Laboratory indicate that Poisson's ratio is closer to 0.25 than 0.30. This conclusion is based on strain gage tests checked three ways. Hot-rolled steel's modulus of elasticity is 28,000,000. Shear modulus is 11,000,000. Accepted figures have been higher.

### COLD EXTRUSION IN METALWORKING MARKETS—P. 152

The first cold extrusion plant is ready to start commercial production. Prototype products have been produced and methods proven. Process combines finish, size and final properties in one operation and saves much machining. In some cases finishing and heat treating are eliminated.

### NEXT WEEK—NEW PART FLOW TRIMS FOUNDRY COSTS

Modern concepts of continuous product flow guided plant layout engineers in setting up this new casting-cleaning plant. Belt and roller conveyors, air hoists, rollovers, and small cranes keep engine parts moving smoothly. Air-powered hand tools are used for many cleaning operations.

## MARKETS & PRICES

### WEST IS STILL A GOLDEN MARKET FOR STEEL—P. 79

Local supplies cannot keep pace with western steel demand. An Iron Age mill by mill survey shows West's steelmakers are planning a 15 pct increase in production of finished steel items for 1953. Tinplate is the hottest product—slated for a 70-pct hike. Pipeline demand is terrific.

### BARS WILL BE TIGHT THROUGH MOST OF '53—P. 85

Cold-finished bars will be a tough item through most of the year, producers believe. And hot-rolled bars will be little better. Raw materials are a major problem but lack of furnace capacity is bringing out little conversion deals. Some rays of hope can be seen.

### HOW TO GIVE THE CUSTOMER WHAT HE WANTS—P. 96

Detroit automakers spend substantial amounts of time and money every year trying to determine public reaction to new cars. Mr. Average Motorist has a lot to say in design, but doesn't always get the last word. Reaction to the competition is rated just as highly as opinions on the surveying firm's line.

### KOREAN PEACE WON'T MEAN DEFENSE SLUMP—P. 101

Investigation shows that end of Korean war will not result in drastic cuts in defense spending. Expenditures for Korea account for only 10 pct of budget. Cuts would be even less because not all the troops would be withdrawn immediately. Indications are that Congress will try to keep industry's production high.

### STEEL PRICES MAY BE RAISED \$4-\$5 A TON — P. 171

The Iron Age prediction that steel prices would be raised at least enough to cover any wage increase is bolstered by statements of three leading producers. Spokesmen for U. S. Steel, National Steel, and Armco may have been paving the way for what they feel is inevitable—higher prices to cover rising costs.

### COPPER PRICE CONFUSION SEEN NEARING END—P. 174

Fringe prices for copper are all settling nearer the 30¢ per lb quoted by major domestic mine producers. Custom smelters at 30½¢. Belgian copper cut to 30¢ C. I. F. New York. Other foreign metal at 28½¢ to 29¢ for future delivery. Magnesium production ordered cut back by Defense Dept.

# GIANT GEAR RIMS

Wedge action die for bending rings in horizontal position. Removable inserts adapt this die for various diameters.

Just another job for versatile CINCINNATI PRESS BRAKES

This 35½" diameter, 4" face steel gear is economically produced by bending and welding.



This steel gear rim is completely formed from flat bar to ring in less than two minutes by repeated hits on a Cincinnati Press Brake.

The wedge action dies require but little tonnage to bend this 2" x 4" hot rolled 35-45 carbon steel bar.

The great versatility of the Cincinnati Press Brake eliminates the need for an additional and highly specialized machine on this small-run job.

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*Contact our Engineering Department, who will suggest and advise on your production problems.*

**THE CINCINNATI SHAPER CO.**

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## Editorial — The Iron Age

FOUNDED 1855

# The Happy Gambler

THERE is a fellow in our midst who gambles that things are going to be fine—always. He pays no attention to analysts, business experts and editors.

This chap is responsible for the millions of autos, radios, television sets and appliances. Because of this, he helps the sale of machine tools, metals and machinery. His desires cause homes to be built, factories to expand and employment to rise.

He is the darling of the ad man, the delight of the phone salesman, the target for the radio announcer and the answer to the television pitchman's prayer.

He made radios dirt cheap. Without him, television sets today would cost us cautious folks \$800 instead of \$199.50—he bought them before we did. He brought the cost of cars down so we could get a \$12,000 job for about \$2500.

People who take this gambler apart do so by figures—averages, norms, differentials and digits. They don't know him personally. In fact, they don't know anything about him.

Who is this fellow? Well, he has a job and he is a little cynical about forecasters, businessmen who moan the blues and products which don't measure up. He hates calamity howlers.

The man about whom we write is the installment buyer. He buys (and always has bought) "on time" what he wants and can use today and pays from tomorrow's wages. Without him we would have no mass producing industry.

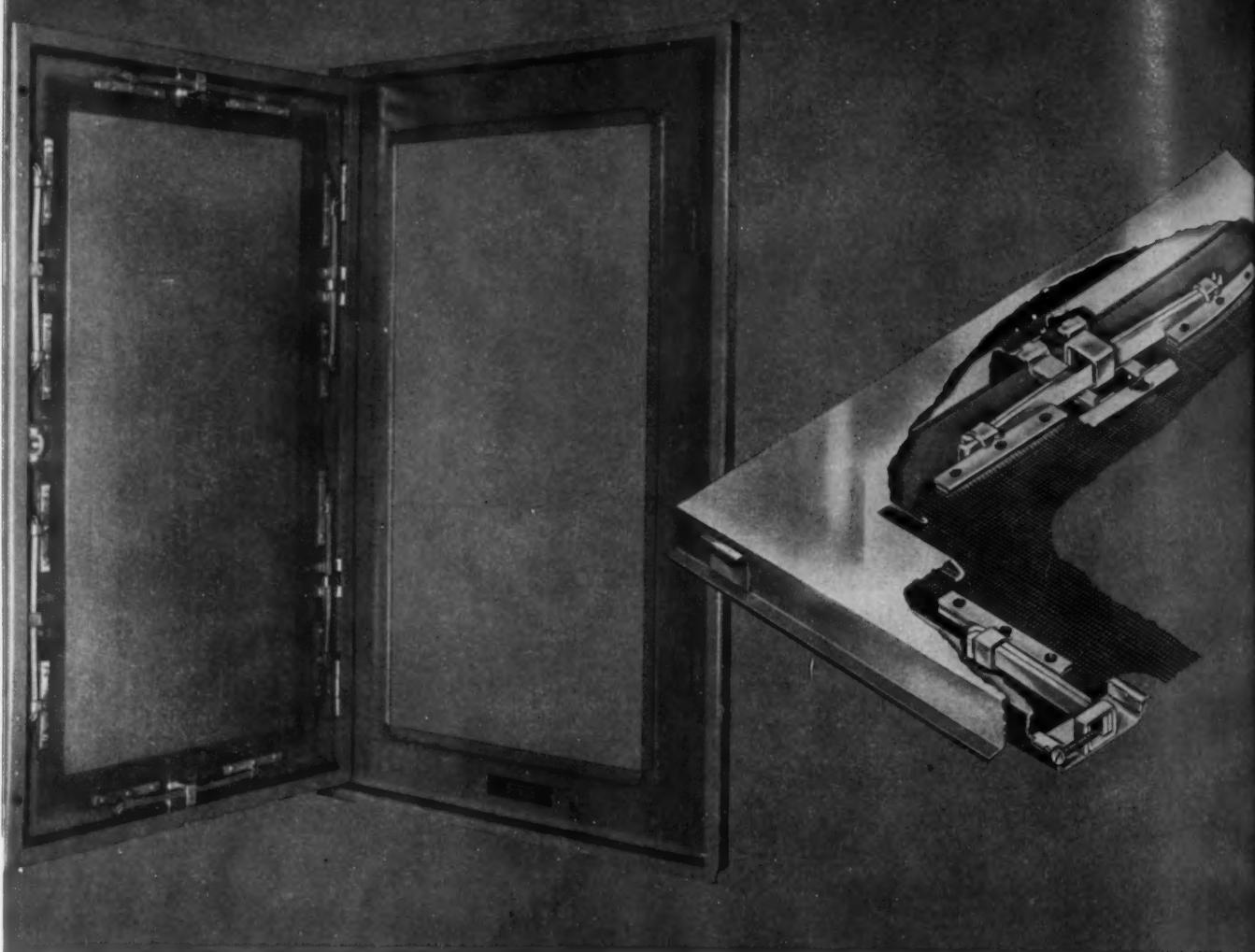
He believes the ads, admires the products and eventually pays—losses on his gamble are less than 1¢ for each dollar. As fast as he pays for one thing, he buys another.

He is not through buying by a long shot. His limit has not been reached. He knows more about what he is doing than the experts. His philosophy may be cockeyed—but people who don't see his way of life could not have their standard of living without him.

He may not know it but he has more faith in business, his country and the future than maybe you and I have.

Tom Campbell  
Editor

# SHARON STEEL



## Here's Window Construction that's Different

Windows are primarily built to divert everything but the sun, air and view. There are concerns, however, who build windows primarily to prohibit escape. They are detention windows, and find their market in jails and prison hospitals. They require special construction to give them the strength to resist the attacks of both men and weather, and a special design that discourages tampering.

Special hard, rust-resistant steels,

such as Sharon Galvanite\*, are used in the frames. Tough stainless steel screening is firmly gripped by strong spring steel fingers. Here Sharon high carbon spring steels are used to accomplish that never-tiring hold that eliminates the possibility of screen removal. Moldings and exterior trim, subject to the ravages of weather, utilize the best weather-beater of them all—Sharon Stainless Steel.

If you're making windows, or a product that requires quality steel, or if your needs are for standard hot or cold rolled steels, and you want the finest, specify SHARON STEEL all the way.

\*T.M.

**SHARONSTEEL**

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For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

# Dear Editor:

Letters from readers

## What's Ahead

Sir:  
Your editorial "What's Ahead For You" in the Apr. 2 issue is very timely and we would like to bring it to the special attention of our sales force.

Would it be possible to supply us with 50 reprints of this editorial. If you cannot furnish reprints, would you grant us permission to reproduce your editorial and distribute copies to our sales force.

G. W. MCINTYRE, JR.  
Advertising Manager  
Bed-Prentice Corp.  
Worcester

## Container Lining

Sir:  
Will you please advise the writer as to the name of the company producing the plastic type coating used to line steel drums as mentioned on the Newsfront page of the Mar. 19 issue?

G. S. HUGHES  
Buyer  
American-La France-Foamite Corp.  
Albion, N. Y.

The producer is the Verac Co., 147 Meadow Road, Rutherford, N. J.—Ed.

## Dies and Inserts

Sir:  
We were interested in the picture of the Rheem Mfg. Co.'s forging press operation in the Mar. 26 issue since our company has forged most of the dies and inserts which manufacture the shells produced by Rheem's San Pablo, Calif. plant.

The problem confronting Rheem was die life. Machining dies and inserts from solid bar stock, as was the practice of other shell producing plants, proved to be a costly venture and a waste of time, money and material.

Bethlehem CrMoW billets (high chrome, high tungsten steel) were purchased for the specialized forging process engineered at Berkeley Forge & Tool. Pieces are cut to weight and forged to the proper shape to fit a ring tool confining the forging. An insert ring is placed on top of the forging with a bore to receive the nose pin, and the pin is driven down to a flush position with the bolster. A slight draft in the bolster allows the forging to fall out when pulled back from the hammer die.

A second heat is taken and the same driving process is repeated with a slightly larger ring bolster and a slightly longer finish pin. When the pin displaces the center stock it extrudes around the pin and climbs to the proper wall height and the job is made ready for annealing, machining, heat treating and grinding.

The grain flow thus produced gives 300 pct more die life with a saving of .7 lb of material and \$10 each on machining over solid bar stock methods. Proper care must be used at all times in the handling of "CrMoW" steel. The steel must be preheated before entering the furnace and held at 1950°F. If steel is overheated (even though not burned) grain growth occurs and die life is lessened in proportion.

If the steel is worked too cold, forging cracks will result. These cracks may or may not be readily seen after forging but may become visible in the machining process causing the forging to be scrapped. Assuming that proper heating and forging practices are used there is still danger of forging loss if the forging is left on the floor to air cool. forgings must be placed in a furnace at 1550°F immediately after forging and allowed to anneal overnight.

R. HAWLEY  
Partner

Berkeley Forge & Tool  
Berkeley, Calif.

## Retards Hardening

Sir:

On p. 57 of your Feb. 26 issue is a short item on a refrigerator that takes a 32-ft wing panel which has been placed in operation by one big aircraft maker.

Where can I get more detailed information on this 5000-eu ft freezer?

J. J. SELLAUS  
District Engineer  
York Corp.  
Philadelphia

Further information may be obtained from Lockheed Aircraft Corp., Burbank, Calif.—Ed.

## Financial Analysis

Sir:

Would you be so kind as to furnish the writer with two copies of the "Financial Analysis of the Steel Industry" just completed by THE IRON AGE.

R. E. McCORMACK  
President  
Consolidated Supply Co.  
Picher, Okla.

## Coloring Steel

Sir:

Would you be good enough to inform us where we might secure information about the dyeing or other methods of coloring steel.

S. A. FLETCHER  
Gray Co., Inc.  
Minneapolis

Several methods for coloring steel are described in the latest edition of the Metals Handbook, published by the American Society for Metals.—Ed.

"I Say  
Sheet Coil"



"I Say  
Thinsteel"

## Which kind of Cold Rolled Strip Steel is best for You?

### CONSIDER SHEET COIL

- if variations in physical characteristics are permissible.
- if fairly heavy oversize gauge variations are not objectionable.
- if the fabricating operations are not too complicated and do not require intricate expensive dies.
- if a fine surface finish is not essential.
- if a good base for paint or enamel is desired.
- if you do not object to some "square footage" loss due to oversize variation.
- then Sheet Coil will probably be the most economical material for the job.

### CONSIDER THINSTEEL

- if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances.
- if you wish to keep die wear low, no oversize gauge variations.
- if you require a fine finish or a better base for plating.
- if you want maximum yield for "most finished parts per ton."
- if you want selected tempers for maximum strength and lightest weight.
- then you'll find Thinsteel the most economical material by far.

No Argument  
Here.... Kenilworth  
Stocks Both

You can always count on Kenilworth helping you get the right steel for your requirements. Order Sheet Coil or Thinsteel and notice that each coil carries an identifying tag as pictured above. Call on Kenilworth, too, for your needs in Stainless Sheets or flat rolled Spring Steels (Annealed or hardened and tempered).

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Tank Lining



Abrasive Wheels

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Asbestos Textiles • Teflon Products • Packings • Sintered Metal Parts • Bowling Balls

# Fatigue Cracks

by William M. Coffey

## To Wit:

We laughed and laughed when Mr. F. C. Rodgers of The Cardox Corp. kindly sent us the following definitions to be added as a supplement to the Handbook of Terms Commonly Used in the Steel Industry which we recently printed in your *ffj*. After looking them over we'd say they have a much wider application:

"It is in process"—So wrapped up in red tape that the situation is practically hopeless.

"We will look into it"—By the time the wheel makes a full turn, we assume that you will have forgotten about it, too.

"Expedite"—To confound confusion with commotion.

"Channels"—The trails left by interoffice memos.

"Coordinator"—A guy who has a desk between two expeditors.

"Consultant or Expert"—A guy more than 50 miles from home.

"To activate"—To make carbons and add more names to the memo.

"To implement the program"—Hire more people and expand the office.

"Under consideration"—Never heard of it.

"Under active consideration"—We're looking in the files for it.

"Meeting"—A mass mulling by master minds.

"Conference"—A place where conversation is substituted for the dreariness of labor and the loneliness of thought.

"Negotiate"—To seek a meeting of minds without a knocking together of heads.

"Re-orientation"—Getting used to working again.

"Reliable Source"—The guy you just met.

"Informed Source"—The guy who told the guy you just met.

"Unimpeachable Source"—The guy who started the rumor originally.

"Let's get together on this"—Come down to my office; I'm lone-some.

That about does it for today. We hope to get more from time to time. If you have any, how about sending them along? Be fun to keep this going.

## Materials Handling Issue

For some months now our famed editorial department has been working on a red hot program (any assignment that can't be completed by one telephone call). It concerns the huge May 7th issue of

your *ffj* which will be the most complete, comprehensive and informative review (swamped with photographs) ever published on materials handling.

A team of editors has searched far and wide and has found all the secrets, new methods and new equipment used presently by such companies as Ford Motor, Western Electric, General Motors and dozens of others in all phases of metalworking, including foundries. All this will be in that big issue.



"Let's get together on this."

Photo shows IRON AGE editors D. I. Brown and Robert L. Hirschek working on a 3-dimensional model of part of an artillery shell plant, complete with conveyors, cranes, cut-off machines, washing unit, etc. They're soldering a "structural steel" joint on a crane runway to get the model ready for the photographers. You'll see it illustrating an article in this special issue. Be sure to get it even if you have to renew your subscription.

## Puzzlers

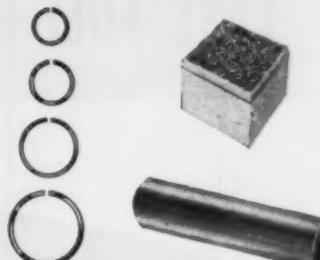
The answer to the cow and rope puzzler is 2 2/3 days. Winners: Charles H. Jennings, Sargent P. Jackson, William E. McCord, Mary Lou Perrott, L. S. Cochrane and J. M. McInerney.

## New Puzzler

A snow plow has a maximum speed of 15 mph, less 1 mph for each inch of snow on the road. This plow leaves town at noon, during a snow fall which continues at the rate of 1 inch per hour. Assuming that the plow maintains maximum speed for two hours, during which time it covers 22 miles, what time did it start to snow? Many thanks to Mr. Sidaway of Canada for this.

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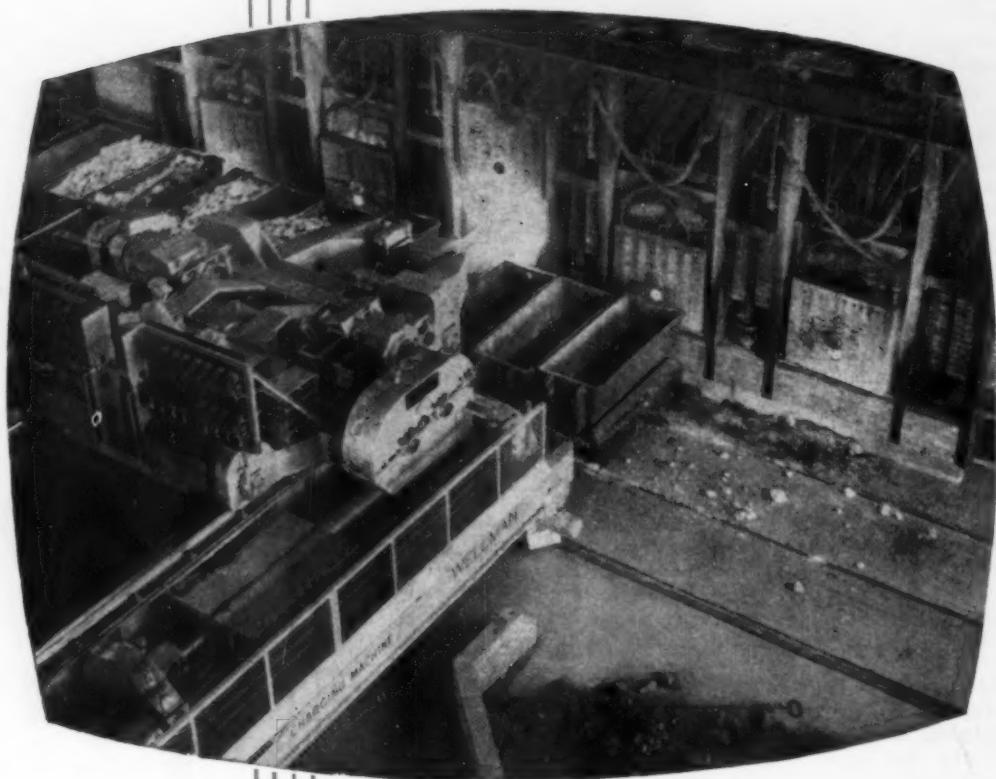
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## Dates to Remember

### Meetings

#### April

WOVEN WIRE PRODUCTS ASSN.—Semiannual convention, Apr. 26-28, Grove Park Inn, Association headquarters are at 1721 W. School St., Chicago.

AMERICAN ZINC INSTITUTE—Annual meeting, Apr. 27-28, Hotel Statler, St. Louis. Institute headquarters are at 60 E. 42nd St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Spring meeting, Apr. 28-30, Deshler-Wallick Hotel, Columbus, Ohio. Society headquarters are at 29 W. 39th St., New York.

#### EXPOSITIONS

MATERIALS HANDLING SHOW—May 18-22, Philadelphia.

NATIONAL METAL SHOW—Oct. 19-23, Cleveland.

CONCRETE REINFORCING STEEL INSTITUTE—Annual meeting, Apr. 27-May 2, The Carolina Hotel, Pinehurst, N. C. Institute headquarters are at 38 S. Dearborn St., Chicago.

WIRE REINFORCEMENT INSTITUTE, INC.—Annual meeting, Apr. 27-May 3, Carolina Hotel, Pinehurst, N. C. Institute headquarters are at National Press Bldg., Washington.

#### May

NON-FERROUS FOUNDERS' SOCIETY, INC.—Annual meeting, May 4, Chicago. Society headquarters are at 192 N. Clark St., Chicago.

CENTRAL FABRICATORS ASSN.—Annual meeting, May 4-5, Skirvin Hotel, Oklahoma. Association headquarters are at 53 W. Jackson Blvd. Chicago.

COMPRESSED AIR & GAS INSTITUTE—Spring meeting, May 4-6, King & Prince Hotel, St. Simons Island, Ga. Institute headquarters are at 122 E. 42nd St., New York.

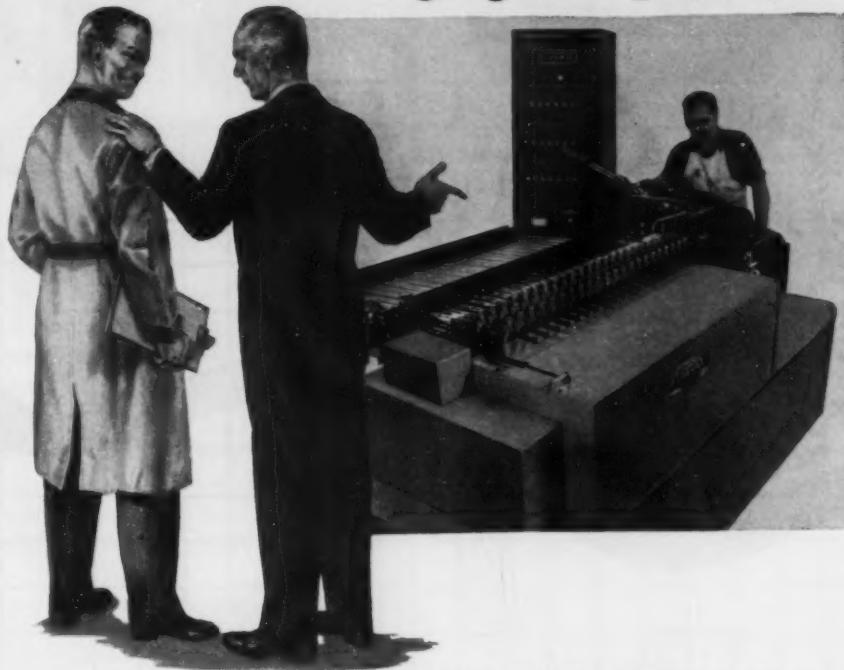
COMPRESSED AIR & GAS INSTITUTE—Spring meeting, May 4-6, King & Prince Hotel, St. Simons Island, Ga. Institute headquarters are at 122 E. 42nd St., New York.

AMERICAN FOUNDRYMEN'S SOCIETY—Annual meeting, May 4-8, Chicago. Society headquarters are at 616 S. Michigan Ave., Chicago.

INDUSTRIAL FASTENERS INSTITUTE—Annual meeting, May 6-8, Westchester Country Club, Rye, N. Y. Institute headquarters are at 3648 Euclid Ave., Cleveland.

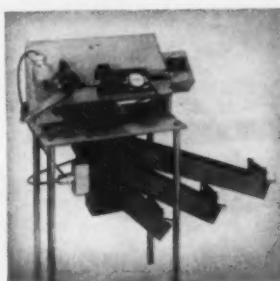
NATIONAL WEDDING SUPPLY ASSN.—Annual convention, May 11-13, Gibson Hotel, Cincinnati. Association headquarters are at 1900 Arch St., Philadelphia.

## "Automation" Gaging sure pays off!



"AUTOMATION" IS ALREADY AN ACCOMPLISHED FACT in dimensional inspection. Federal Automatic Gages perform, at high speed and without human error, the same functions as human inspectors. A Federal Automatic Gage checks the linear measurements of the workpiece, rejects it if oversized, or sorts it into one of several dimensional categories for Assembly. Install it directly in your production line if you wish. It gages, sorts and distributes parts at speeds which until recently were fantastic and to limits in the order of 25 millionths of an inch or better. One such gage sorts parts into six different size classifications of .0001" at the rate of 400 per minute. Any or all gaging systems can be used — electronic, electric, or air.

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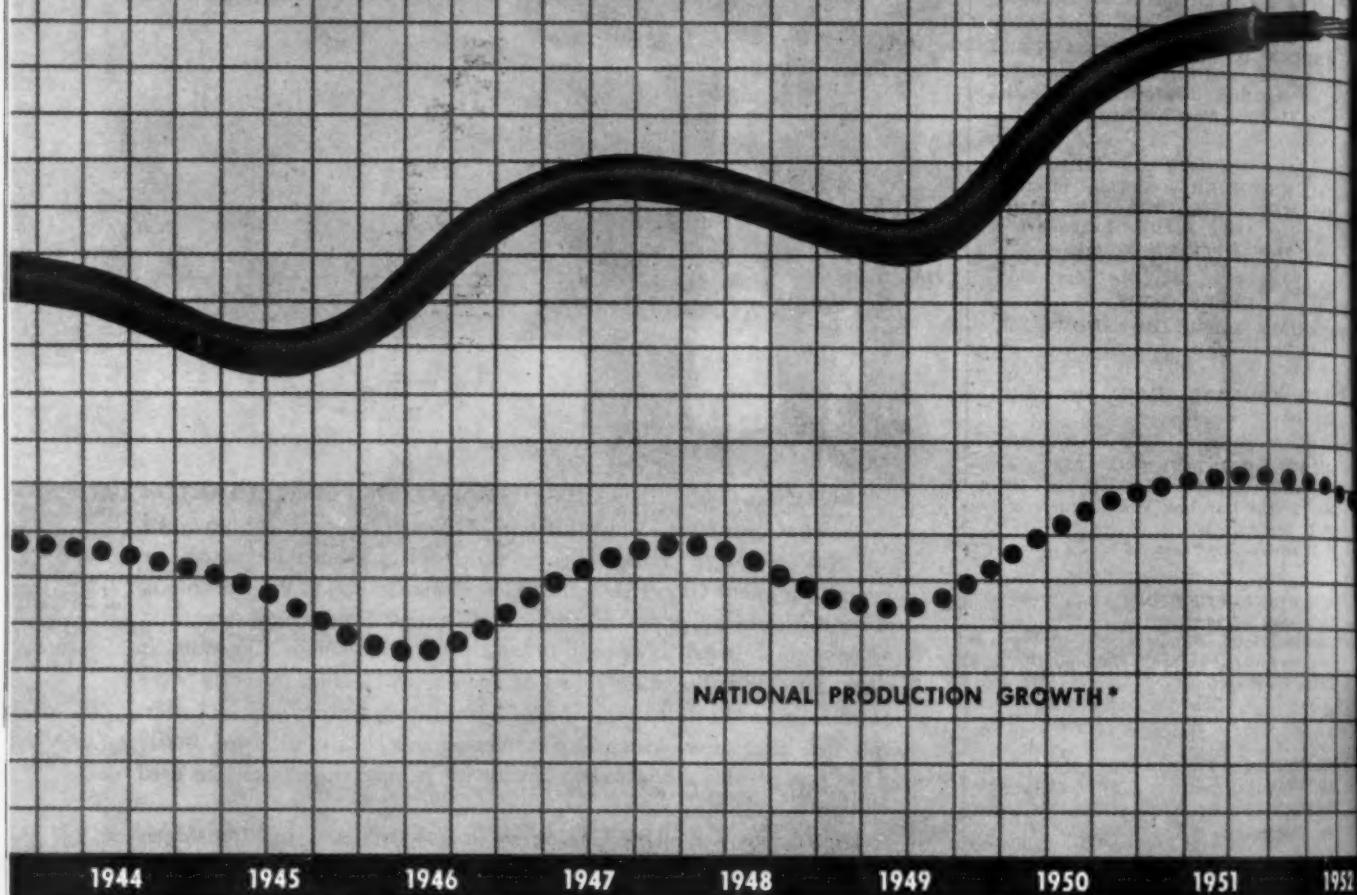
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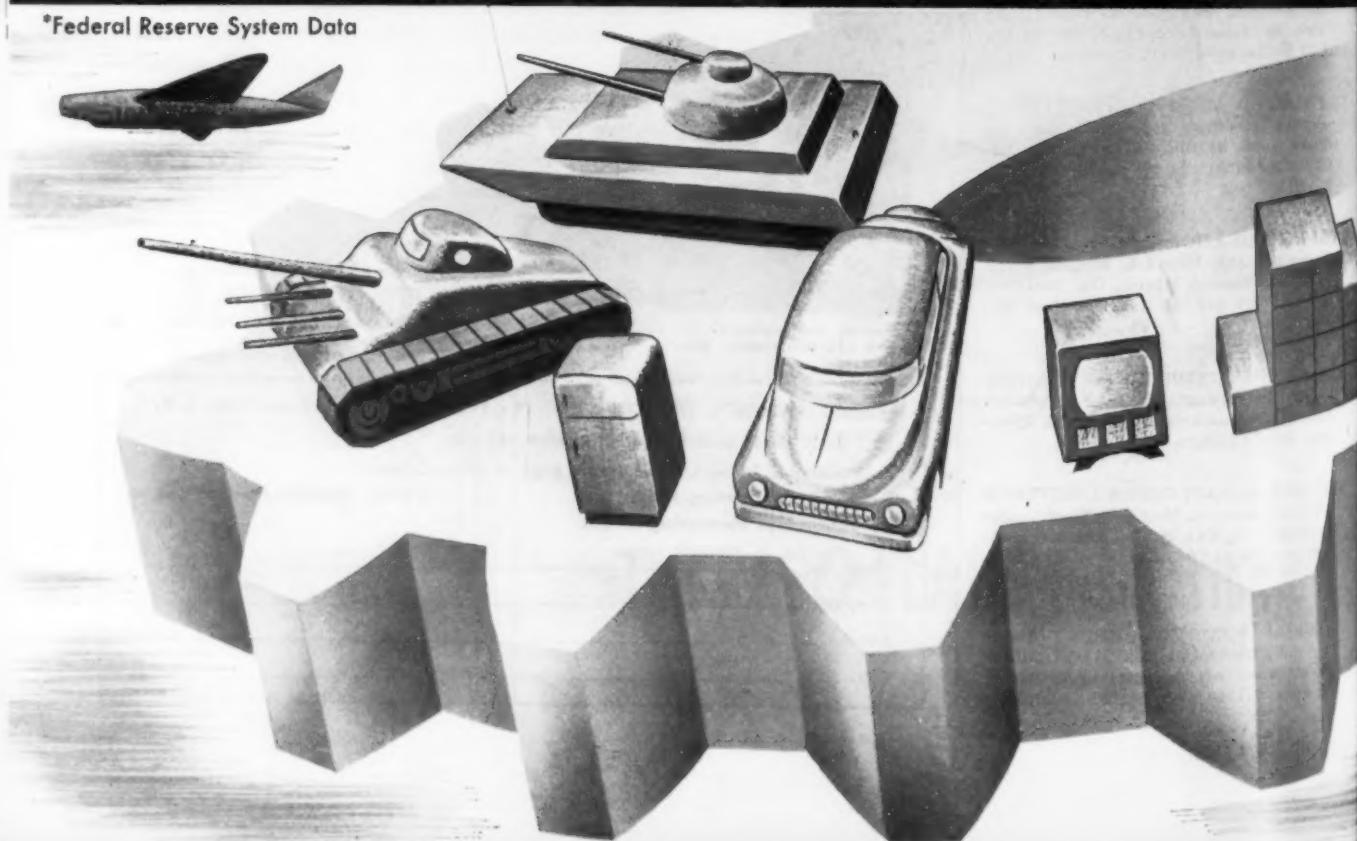
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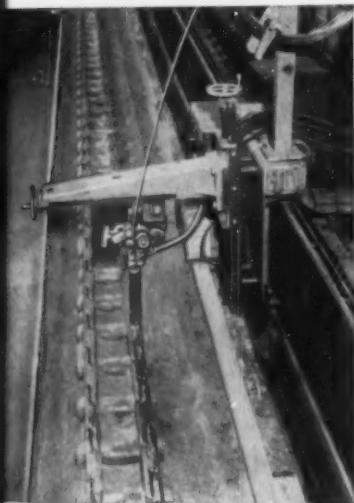


# LINDE'S News of Metalworking

## Worn Parts Rebuilt Economically by UNIONMELT Welding

Repair of worn tractor parts is most practical and economical with specially developed fixtures on which standard UNIONMELT welding units are mounted. The metal deposited by UNIONMELT welding is so smooth that no grinding or finishing is required. Experience indicates that resurfaced areas will wear as long as new parts.

The Berkeley "Conservall" fixture is designed especially for rebuilding crawler tractor track links or rails without disassembling them. The track is placed in a trough and clamped in position. A LINDE side-beam carriage



Tractor rail links rebuilt in "Conservall" machine by UNIONMELT welding. Cams automatically control welding action for each link.

moves the UNIONMELT welding equipment over the positioned track and the welding of each link is automatically started, stopped, and accurately controlled. Rollers, idlers, sheaves, and other circular work can also be welded or resurfaced on another section of the machine.

The terms "Linde," "Oxweld," and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

The "Leader" machine is also available for rebuilding both cylindrical and flat parts. Rollers are rebuilt on top of the machine. Larger parts, such as idlers, are mounted in the chuck at the side of the machine as shown. With the flat work attachment, parts such as disassembled track rail links, grousers, bulldozer blades, end bits and fabricated members can be resurfaced easily. This attachment is operated by a gear which is mounted in the chuck.



These tractor rollers and an idler were rebuilt at a speed of 30 in. per min. by UNIONMELT welding.

With both machines, the wheels can be tilted for rebuilding the flanges. It takes only 80 to 90 minutes to rebuild a D-8 track roller. Idlers take about three times as long.

OXWELD 1928 rod is normally used in making these repairs. When wear is excessive, OXWELD 296 rod is sometimes used for the initial buildup which is then finished with OXWELD 1928 rod. For such resurfacing, use either Grade 80 or Grade 90 UNIONMELT welding compositions.

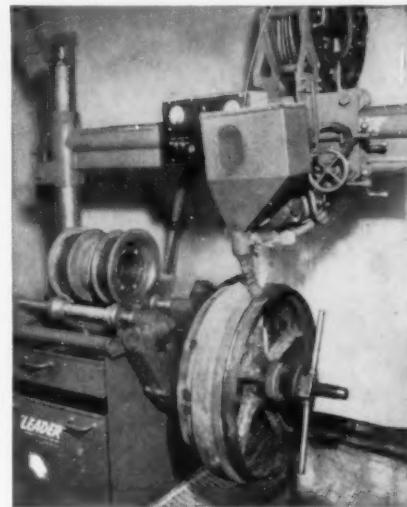
For some services, a finishing pass with a higher alloy tube rod is applied to produce a harder surface. While material of almost any hardness can be applied, one combining hardness and toughness lasts longer than one of higher hardness that tends to spall and chip. As deposited, OXWELD 1928 material has a hardness of about Rockwell C-25, but in service the working

surfaces actually develop properties which cause them to outwear deposits that are substantially harder.

## Advantages of UNIONMELT Build-up

UNIONMELT welded resurfacing is especially attractive with these automatic machines which readily permit deposit rates of 20 lbs. per hour. Savings in time and the advantages of a smooth uniform deposit justify the initial investment in automatic equipment. Important in these times is the conservation of metal realized with the process. The use of approximately one hundred pounds of weld metal saves replacement of 2,000 to 3,000 pounds of new parts.

LINDE's engineers and technicians will be glad to give further information about UNIONMELT welding. Telephone or write today.



UNIONMELT welding head on "Leader" fixture rebuilds rollers and idlers. Rollers are welded on top of the machine, idlers at the side, and flat parts, depending on their size, can be welded on top of the machine or in the flat work attachment.

## LINDE AIR PRODUCTS COMPANY

A Division of Union Carbide and Carbon Corporation  
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# Problem...

**GETTING GREATER FLEXIBILITY, MAXIMUM UTILIZATION OF SCARCE STEEL WITH SMALLER INVENTORIES . . .**



Industrial building corridor shows the variety of panel widths required. Note ripple-free flatness of panels. Hauserman can cut these from one width of coil stock.



Neat, trim business office of Hauserman panels. Note clean window lines and wainscoting. Hauserman now can produce any necessary width from wide coils, eliminating heavy steel inventories.

The E. F. Hauserman Company, Cleveland, Ohio, is the world's largest manufacturer of movable steel partitions and wainscot panels. Their operation demanded flat steel of innumerable dimensions, trimmed and leveled to precision flatness. As the sheets came from the steel mills they were stretcher leveled to commercial tolerances, or a buckle of not over  $\frac{1}{4}$ " high. But in the manufacturing of Hauserman partitions, they insisted on the maximum tolerance of  $\frac{1}{16}$ ", or practically dead flat.

The steel mills had met Hauserman's flatness

requirements, but it was costly for them as well as Hauserman. Steel producers encouraged Hauserman to look into the possibilities of providing their own leveling facilities. Add to this the fact that Hauserman's operations required sheets of many sizes in lengths from 3 to 12 feet and widths from 1 to 5 feet. In using mill sheets Hauserman had either to stockpile multiple lengths and widths to obtain a flexible inventory or to stock larger sized sheets and trim them as they were needed — which resulted in unnecessary waste.

DESIGNING AND BUILDING TOMORROW'S METAL WORKING

## THE IRON AGE Newsfront

HYDRAULIC CYLINDERS ARE REPLACING COIL SPRINGS on certain die stripper applications. The hydraulic cylinder is cold-extruded from one piece of 1012 steel. The old cylinder was made in three pieces from 4130 steel. New cylinder withstands 30,000 psi.

NEW ENGLAND SPONSORS have dropped the plan for an integrated steel mill. But new studies are being made to determine the prospects for an electric furnace mill.

GOOD MANAGEMENT PRINCIPLES, applied to safety problems, produce encouraging results. One company reports a 45 pct reduction in lost time accidents in the past 4 years. The program: Study individual jobs and employees for safety hazards; take positive action.

TITANIUM PROTECTED WITH SILICON coatings has withstood temperatures of 800° C in air. Samples were prepared by paint and sinter method. Helium or a vacuum appeared superior to hydrogen for sintering purposes.

PRODUCT DIVERSIFICATION is the smart warehouseman's answer to narrow profit margins on run-of-mill steel products. Look for more of it. One operator now has 50 pct of sales in aluminum and stainless. Five years ago he sold no aluminum, practically no stainless. Despite this, his steel volume is up too.

SPHEROIDIZED, HOT TOP QUALITY PLATE FOR THE SHELL PROGRAM is now produced by a fourth major steel mill. Indications are a fifth major mill may soon supply the material, possibly at government urging. Mills are not eager. Hot top ingots require longer soaking, cut available pit capacity, slow flat-rolled production.

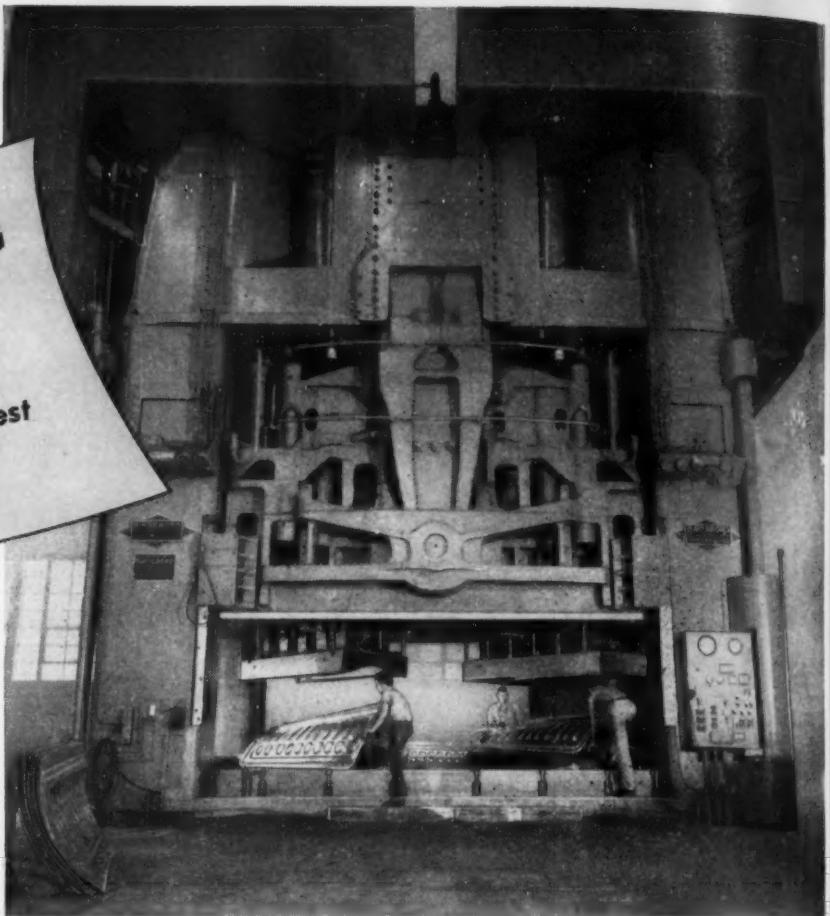
LARGE NUMBER OF MAGNESIUM DIE CAST PARTS are used on a new Packard V-8 engine being tested. Included are oil pan, rocker box cover, gear case. Engine weight has been cut to about 650 lb.

NICKEL IN CUBAN IRON ORE WOULD LAST THE UNITED STATES 200 YEARS—IF it could be extracted economically. In 1900 all alloy steels contained nickel. In 1952 only 24.5 pct contained nickel.

WIDE DISPARITY BETWEEN METALLIC CONTENT OF NO. 1 AND NO. 2 scrap bundles has shown up in recent tests by a large consumer. Average Fe content of No. 1 bundle is 98 pct; No. 2 bundles average 85 pct.

BRASS-COATED WIRE WILL COMPETE WITH NYLON as reinforcement for automobile and truck tires, if costs can be brought into line. Tests show blowouts on wire-reinforced truck tires are virtually impossible. Some tires have operated more than 1.5 million miles with numerous retreads, are still going strong.

CONTINUOUS CASTING OF STAINLESS STEEL is the main interest of a project scheduled to start production next November in Canada. A Rossi-type machine with oscillating mold will cast steel in sections to  $5\frac{1}{2} \times 21\frac{1}{2}$  in., in lengths to 16 ft.



Exerting 16,000,000 lbs. pressure, this 8,000 ton press is forming plane sections up to 10 x 30 ft. in 1/2 in. aluminum.

# BIRDSBORO

## *hydraulic press*



The new Birdsboro Hydraulic Press takes its place in Lockheed's "Hall of Giants", housing a multimillion dollars worth of heavy-duty production machinery.

Agents In:  
Boston, Massachusetts—Cincinnati,  
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Missouri—Los Angeles, California—  
Oklahoma City, Oklahoma—Pittsburgh,  
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# BIRDSBORO

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# ALUMINUM: Continuous Casting Gaining

**Method paves the way for small firms to integrate . . . Techniques improve steadily . . . Announce new Properzi model . . . Working towards automation of controls—By R. L. Hatschek.**

Methods of continuously casting and processing aluminum are showing increasing promise of becoming an excellent way for small fabricators to integrate their operations. Relatively low capital outlay plus the ability to gear production to actual needs are the advantages that smaller firms can well utilize.

Improvement in techniques is continuing at a rapid clip. A machine that proved economical at 800 lb per hour has been stepped up to 1800 lb per hour. Output of the newest equipment will be even higher. And the lone operator may be replaced by automatic controls.

Several methods now employed in the U. S. produce fairly good-sized slabs which must be further processed in the usual mill fashion. These might better be called semi-continuous.

#### Make Thin Strip

More nearly continuous, from one end to the other, is the system used by Hunter-Douglas Corp. in producing aluminum alloy venetian blind strip. This machine casts a 1 x 2½-in. bar which runs into an oven to hold it at rolling temperature.

When proper length has been cast a flying shear trims the bars. These are hot-rolled to 0.125-in. strip and coiled. Further cold-rolling produces final thickness of about 0.008 in.

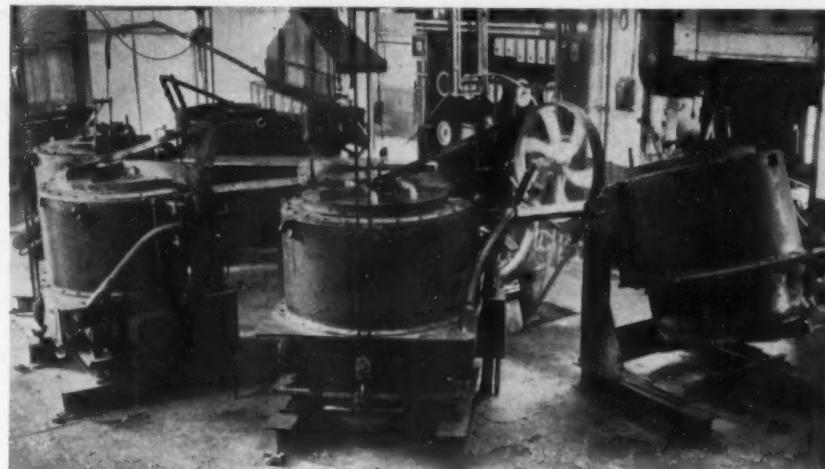
One machine, the Properzi, seems to have caught on more than the others in this country. Here the casting and hot-rolling are truly continuous with the aluminum flowing uninterrupted

from the pouring spout, through the mold and rolling stands, to the coils of redraw rod that are the final product of the machine. Rods are drawn into wire for such products as electrical conductor, nails and similar wire products.

It works like this: A battery of induction furnaces melt scrap or ingot aluminum. These continually feed into a pouring spout which introduces molten metal into the mold, a V-shaped cavity in a

The Properzi machine is the only one which casts such a small section, roughly a 1-in. triangle on Type 4 equipment, and is used more widely than any other continuous aluminum casting machine. Four are currently in use by Nichols Wire & Aluminum Co., U. S. distributor for the machines, General Cable Corp., Anaconda Wire & Cable Co., and Rome Cable Corp.

Within the next few months, three more companies will be receiving Type 4 Properzi machines. They are Southwire Co., Essex Wire Corp. and Aluminum Co. of America. Allegheny plans to



BATTERY of five induction furnaces is used to supply aluminum to Properzi machine.

water-cooled copper casting wheel. A steel band forms the third side of the mold. For further cooling the bottom of the wheel runs through a water tank.

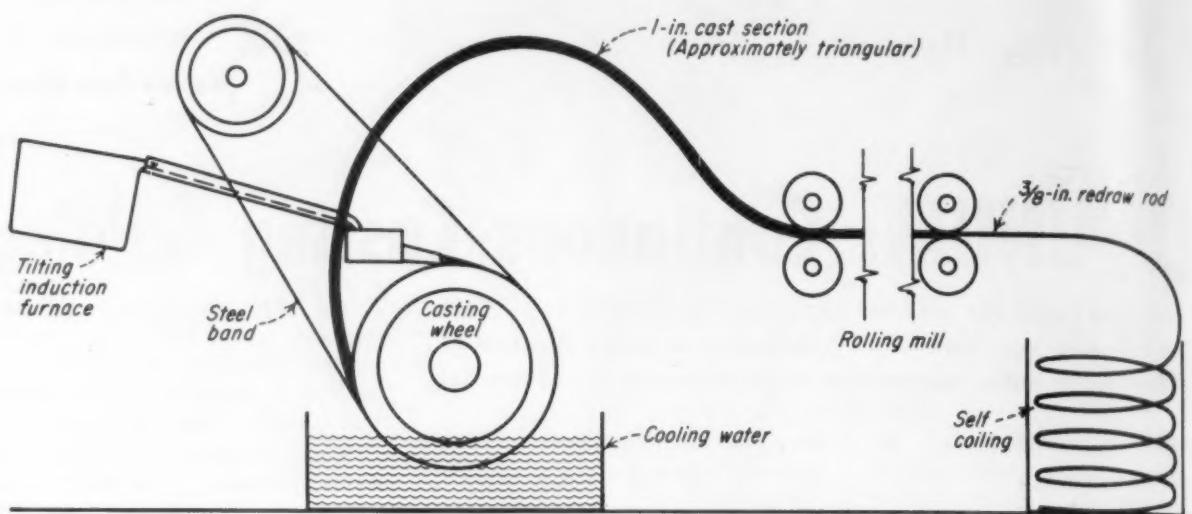
Triangular bar is stripped from the mold, loops over the operator and is guided into the rolling mill. Three rolls at each stand, spaced 120° radially, work on the corners of the still hot bar. Cross section is alternately round and triangular. Redraw rod emerges and is coiled.

use the machine for experiments.

Production rate of the first type Properzi machine to be used in the U. S. (almost 3 years ago) was about 800 lb per hour. Cast section was approximately 0.50 sq in. Present equipment casts a section of about 0.75 sq in. at an 1800-lb per hour clip.

Original rolling mill consisted of 15 sets of 3-roll clusters. Usually only 13 of the stands were used. Type 4 rolling mills are of the same cluster design

## Special Report



SCHEMATIC of Properzi continuous casting process. Molten aluminum flows from furnace to casting wheel. Bar loops over to rolling mill.

but the number of passes has been cut to 13, of which nine are used in producing standard  $\frac{3}{8}$ -in. redraw rod. The mill has been considerably beefed up from original experimental equipment.

### Develop Improved Version

Latest development in the process is labelled Type 5. Modification, which may be made on Type 4 equipment, consists of cutting a deeper mold cavity in the casting wheel to produce a section of approximately 1.2 sq in. and placing rolls to accommodate the heavier section at stations one and two of the rolling mill.

Other stations are moved down, so  $\frac{3}{8}$ -in. rod is taken off the eleventh pass instead of the ninth.

Production rates of 2000 to 2200 lb per hour are expected from the new type equipment.

### Cost Is Low

Machines of this sort can mean a great deal in integration for small companies. A unit capable of producing 1500 lb per hour, including furnaces and accessories, requires a capital outlay of about \$175,000. Aluminum scrap or ingot can be fed into the furnaces and rod emerges from the other end.

Output of the rod can be matched to total production requirements of the end product. This eliminates the need for high volume production of large and

expensive mill equipment as well as taking very little floor space.

The U. S. distributor states that production bugs usually encountered in starting up any new equipment are generally worked out in a relatively short time. With Properzi equipment difficulties have sometimes been encountered in the shape and placement of guide rolls which direct the cast bar to the rolling stands.

Other bugs sometimes crop up

in temperature control. Relatively accurate control of temperature is desirable at the pouring spout, where the bar is stripped from the casting wheel, and where it enters the rolling mill.

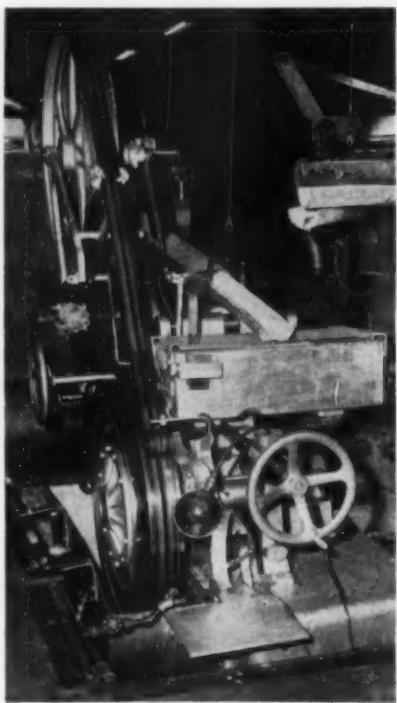
At present Anaconda Wire & Cable is working on development of automatic devices for control of temperature and certain other factors. If experiments are successful, they will eliminate need for the single operator and make the machine fully automatic as well as continuous.

### Work on Automation

Not only can this machine benefit small companies, it can also be used to advantage where larger production runs are necessary. Properzi units have been run continuously for periods up to 20 hours a day.

And one firm even planned to run the redraw rod directly from the rolling mill to wire drawing machines. There is no reason why this would not work, but it would be best only where large quantities of a single wire size are to be produced. Because the firm desired more flexibility, the plan was dropped.

Another advantage of the process is the low scrap loss. Scrap is generated only at the beginning and end of a production run. This almost negligible amount is then recharged into the furnaces that feed the machine.



HEART of the process is the water-cooled casting wheel (bottom). Mold is closed by steel band running from idler wheel.

## Production

# STEEL: West Still Golden Market

Supply can't keep pace with area demand . . . Plan 15 pct finished product rise in '53 . . . Tinplate biggest item, with 70 pct rise planned . . . Pipe line demand high—By T. M. Rohan.

Western steel is out to rack up another banner year in 1953 and further close the gap between local production and demand.

An IRON AGE regional mill-by-mill survey completed last week indicated western output of finished products this year is going up substantially in all major categories. All producers were optimistic in their outlook this year, each predicting substantial increases.

Overall ingot tonnage is scheduled to pass the 5-million-ton mark for the first time, labor conditions permitting. The 1953 estimates of finished products total 3,710,872 tons or about 15 pct over actual 1952 output of 3,195,895.

Western steel continues to expand, but still lags behind total area consumption due to biggest population increase anywhere in the U. S.

### Better Than Ever

In terms of steel receipts from all sources, the seven western states are expected to gain three-quarters of a million tons this year over strike-bound 1952 and also top the 1951 record.

Estimated receipts this year will be 6.1 million tons compared to 5.4 million in 1952 and 6 million in 1951. This will be a remarkable gain in 1 year of 11.5 pct. But of the total 6.1 million tons, only 3.7 million will come from mills in the same area.

Biggest single finished product of western mills is still light flat rolled products, principally tinplate, as steelmen struggle to keep up with the California farmers. And 1953 will see the biggest output in history with a whopping 70 pct increase—in one of the biggest U. S. tinplate consumption areas.

The new Kaiser mill dedicated last year is currently up to about two-thirds rated capacity. U. S. Steel's mill at Pittsburg, Calif., is

being expanded with the new section now coming into partial use. By midyear when both are expected to be in full production, combined annual output of tin mill products will be about 550,000 tons.

This will still be short by about 350,000 tons of western consumption of 900,000 tons annually, almost 15 pct of national output. Deficit is shipped in from the East mostly by U. S. Steel and Weirton.

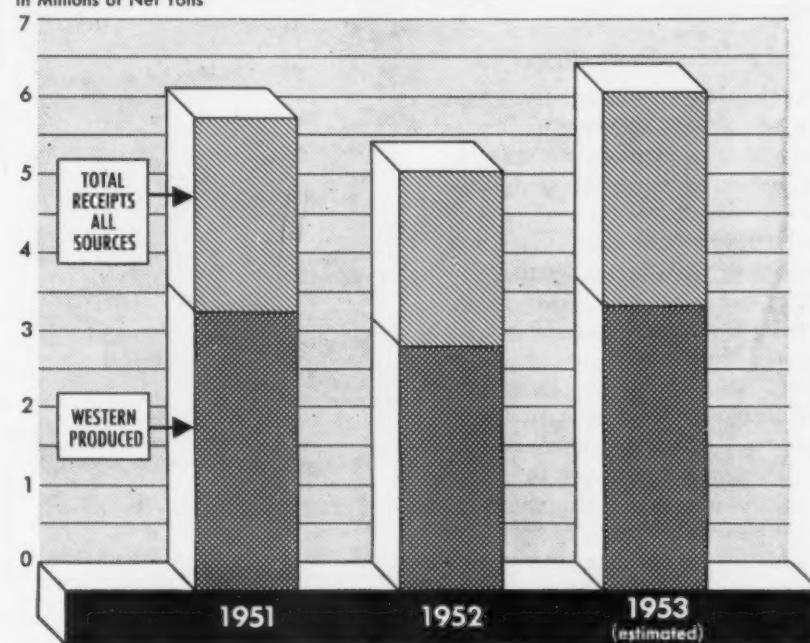
Western mills are steadily getting more finishing capacity but despite this expect to have more ingots, blooms and billets for sale. In 1952 this reached 153,381 tons which despite the strike was a gain over the 1951 output of 120,000 and far over the earlier estimate for 1952 of 94,000 tons.

A new factor in this is the anticipated increase this year by Seidelhuber at Seattle. Until recently limited to straight ingot production from a single electric furnace, this plant is now turning out small round edged billets in a mill which made only token output in '52.

Mills in the seven western states confidently expect to pass the 5-million-ingot-ton mark this year.

## STEEL PRODUCTION-CONSUMPTION IN 7 WESTERN STATES

(FINISHED PRODUCT)



In 1952 the two western mills put out about 640,991 tons of hot and cold-rolled sheet and tinplate. This year they expect to hit 879,800 tons, a 35 pct increase—biggest of any single category.

Pipeline growth continues to keep pipe output the second largest category of western output. In 1952, 563,169 tons of standard and line pipe were produced, but 1953 production is expected to hit 590,400 tons. This is about a 5 pct increase of 27,231 tons.

Current actual predictions are for about 5.2 million tons, up 15 pct over the 4.5 million figure for 1952. For the past month, for example, average operating capacity has been 108.9 pct.

Combined ingot and finished production is expected to drop off about 10 pct from current rates in the second half. But this could still be better than anticipated national performance where the decrease between first and second half may be higher.

## AUTOS: Stretching Nickel Thinner

**Tight nickel controls limit use and thickness . . . Tight market and high auto output compound problem . . . Thickness below authorization . . . Fight corrosion with oil—By R. D. Raddant.**

The automotive brightwork picture looks mighty dim.

A year ago the accent was on research that would make nickel-short trim acceptable to the auto buying public. Now, with auto production eating up nickel at a record rate, the accent is on obtaining nickel to reach even the thickness permitted by government controls.

As a result, many autos are coming off assembly lines with bumpers and other functional parts that do not have the permitted 0.001 in. thickness of nickel with copper-chrome plating.

### Problem Grows Bigger

It should be remembered that this permitted average thickness was never satisfactory. Scarcely any buyer of a recent model car has escaped corrosion problems on his bumpers. And the situation is worse now than it has been.

Extreme shortage of nickel (caused by defense requirements) resulted in imposition of strict controls of nickel usage. In review, CMP controls cut use of nickel to bumpers, bumper guards, door handles and a few other functional parts. Maximum thickness of nickel was an average of 0.001 in. In addition to end-use limitations, the government allotted nickel on the basis of 25 pct of a base period, which could be the maximum quarter of a 1949-50 period.

But today, record auto production rates have aggravated the situation to a point that this quota does not stretch to meet demands. Scarcely any automaker can stand up today and say his bumpers have 0.001 in. of nickel.

### Pay Four Times Market

This situation was spotlighted last week by entry into the U. S. market of nickel from Japan at prices that ranged up to four times

the domestic market price. Some of the major automakers decided not to enter this market, but a number of their suppliers did, and were glad to get it.

Japanese nickel can be purchased without charging it against monthly allocation, but it is still subject to end-use controls. Prices set by importers ranged from \$2.10 to \$2.50 per lb against a domestic price of about 65¢. Anode nickel runs about 90¢ per lb.

Since this over-quota nickel could not be added to end-use

### U. S. NICKEL CONSUMPTION

Short Tons, Excludes Scrap Recovery

	1950	1951	1952†
Stainless steel . . .	21,016	21,792	18,398
Alloy steel . . .	17,777	16,425	11,510
Cast iron . . .	4,881	3,715	2,670
Nonferrous alloys* . . .	28,139	26,338	23,120
High temperature and resistance alloys . . .	5,599	7,408	5,860
Anodes . . .	17,424	5,984	5,157
Plating salts . . .	736	281	280
Catalysts . . .	1,188	1,384	1,086
Ceramics . . .	302	248	114
Magnets . . .	646	391	
Other . . .	1,958	2,195	3,568
Total . . .	99,022	86,416	72,125

\* Includes copper-nickel alloys, nickel silver, brass, bronze, beryllium, magnesium and aluminum alloys; and Monel, Inconel and malleable nickel.

† Nine months figures cover companies which consumed 95% of the totals in 1951.

Source: U. S. Bureau of Mines

limitations, the fact that it was snapped up pinpoints the desperate nickel supply situation.

### Scrap Soars, Too

These are some of the immediate results of the nickel shortage:

Nickel scrap, which is not controlled, is being purchased at prices that range over \$2 per lb in desperate efforts to augment regular sources and maintain a satisfactory thickness on plating.

A secondary effect, that purchasers don't like to talk about, is that a lot of so-called nickel scrap

is not really scrap at all. A lot of the deficiency between allotted nickel and permitted usage had been made up by heavy nickel scrap purchases.

Many platers have had to job out orders because their own nickel allotments have not been sufficient to satisfy requirements.

Extra 5 pct quotas were doled out in some cases during April where platers could show that their original 25 pct allotment was not sufficient to meet minimum authorized needs. It was understood that this practice was to be extended to May.

### Defies Best Brains

Auto researchers have been bending their best efforts to solve the nickel shortage, but so far have come up with nothing that can be termed satisfactory. On non-functional brightwork, 430 chrome stainless has been a satisfactory substitute and a copper-chrome plating with a coating of clear enamel has been used with some success.

There appears to be no satisfactory substitute for a nickel with copper-chrome plating. Zinc alloys have been used as have other plating materials. Substitutes have tended to be too brittle and caused cracks.

Some plating researchers claim bumper size could be reduced to lower nickel requirements and a mild feud exists between these specialists and stylists.

### Good Care Helps

There is little the average car owner can do about the shortage—except take good care of his car's brightwork. Best advise is to have the car washed once a week, then go over the brightwork with a rag soaked in light mineral oil. Even if rubbed off for appearance, remaining oil will fill pores in the plating (where corrosion starts) and prevent rust getting a toe hold.

Meanwhile, auto producers don't like the situation any better than auto owners. They are putting out top efforts to free extra nickel and at the same time try to find a substitute.

## Raw Materials

# NICKEL: Find Prime New Cuban Source

Freeport Sulphur Co. discovers 40-million-ton orebody near Moa Bay, Cuba . . . Will yield both nickel and cobalt . . . Develop new sulfuric acid leaching extraction process.

Discovery of a major new orebody promises some much-needed fattening for dangerously slender supplies of two vital metals—nickel and cobalt.

Freeport Sulphur Co.'s new 40-million-ton ore field at Moa Bay, Cuba, will add an estimated 500,000 tons of nickel and 56,000 tons of cobalt to U. S. reserves. Ore averages 1.35 pct nickel and 0.14 pct cobalt.

### Where It Comes From

Free world production of nickel in 1952 totaled about 157,500 tons, estimates International Nickel Co. Of this total, Canada produced some 140,000 tons. Capacity of the Nicaro facilities, which were not up to full-tilt production at the beginning of 1952, is about 15,000 tons annually.

But Canada is only a relatively minor producer of cobalt. Most of this vital ingredient of many special alloys is mined in the Belgian Congo with other major producing areas in French Morocco and Northern Rhodesia. With the major source a long ocean haul away, another nearby secondary source could be of vital importance in the event of all-out war.

### Climaxes Long Hunt

The Moa Bay find climaxes a search started by Freeport in 1939 for new nickel sources. An earlier highlight had been discovery of the nearby Nicaro field, but company officials told THE IRON AGE the Moa Bay deposit promises to be larger and more valuable.

Freeport is planning a major development at Moa Bay, but will do no refining in Cuba. Ore will be shipped by boat to the U. S. to be refined at Freeport, Tex.

The company is joining forces with American Cyanamid Co.'s subsidiary, Chemical Construction



TEST BORING brings nickel-cobalt ore samples to surface for testing.

Co., to build refining facilities. Freeport had developed the ammonia leaching process for the plant it operated at Nicaro for the U. S. Government in World War II. Research on lateritic ores has now produced an improved leaching process using sulfuric acid.

Maurice Dufours, manager of development for Freeport and one of the pioneers in the leaching process, stressed to THE IRON AGE that Moa Bay ores can readily be treated by the ammonia process, but the new sulfuric acid method has significant advantages. Nicaro

serpentine ores, however, cannot use the new process because of their high sulfur absorption.

Chemical Construction has developed a technique for the production of nickel as a metal rather than an oxide and also for the recovery of cobalt from the ores.

Combination of the sulfuric acid leaching process and the metal technique will represent a considerable advance over the Nicaro method, Mr. Dufours said, since metallic nickel is more valuable than the oxide and the cobalt content of the ore is not lost.

Chemistry of both processes has been proven. Freeport plans a pilot plant to develop information for commercial treatment of the Moa Bay ores in the near future. Company officials recognize that there will inevitably be many bugs to work out, but hope to be in commercial production in about 3 years.

Freeport executives say that the Moa Bay deposit "offers the best opportunity" they've found for a nickel source "capable of surviving in world competition."

### Will Be Competitive

With the current price of nickel at a fairly high level, 63.08¢ per lb for electrolytic nickel f.o.b. New York, several smaller mining firms are operating in Canada.

But despite this, the government has contracted for nickel production at even higher prices in order to bring uneconomical ore lodes into production. One such agreement was with Hanna Coal & Ore Co. for the development of the only known deposit in the U. S. at Nickel Mountain, Ore. (THE IRON AGE, Jan. 29, p. 51).

### Drop IMC Sulfur Rationing

Dissolution of the Sulfur Committee of the International Materials Conference, is scheduled for Apr. 30. This action will follow by about 2 months a termination of the group's recommendations on free-world distribution of crude sulfur. Nickel and molybdenum are the only materials now under IMC allocation.

let 'er go, skip along,  
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"Maverick" usually spells trouble, on the production line as well as out on the range. Being an unknown quantity or a "Johnny-come-lately," it leaves room for genuine doubt both as to performance and to quality. And that's the reason so many experienced buyers—production experts to supervisors—insist on Kester . . . the one "brand" that is synonymous with the best in solder and solder products.

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## Schuman Plan:

Japanese work on plans to combat steel pool competition.

Japanese steel producers are fearful of losing many of their markets to Schuman Plan steel-makers. Planning to export a wide range of metal goods, the resurgent Japanese have decided to establish a central organization to study counter-measures to the Schuman Plan.

At a conference of the Japanese Iron & Steel Manufacturers' Assn., at Osaka, it was agreed that export of 1.3 million tons of steel annually was necessary if Japan is to obtain sufficient credit to pay for vital imports such as iron ore. The Japanese doubt that this volume can be maintained if Schuman countries are able to sell finished steel products cheaper.

### Send Steel Expert

Japanese steelmakers have already stationed a representative at Luxemburg, headquarters of the European coal-steel pool, and the Yawata Iron & Steel Co. has sent an expert to Bonn to report on the progress of the Schuman Plan.

At the Osaka meeting the government was urged to appoint an official thoroughly acquainted with the steel industry to the Japanese legation in Luxemburg and to organize a joint government and private body to make policy recommendations. The delegates also agreed to cooperate in the purchase and distribution of scrap.

### Increase Production

Yawata Iron & Steel Co. has decided to increase its output of pig iron, steel ingots and finished steel products during the first quarter of the coming fiscal year. This step is being taken because of increased demand, particularly for steel rails, from U. S. military authorities and other overseas markets.

The company's first quarter pig iron production target is 323,050 tons.

## ORDNANCE: Reds Have Key Arsenal

Czechoslovakia gives Russia one of Europe's most formidable war machines . . . What Czech plants produce . . . Large shipments of arms to China reported . . . But production slows.

If the Red peace offensive really isn't triggered to another Russian booby trap, the clamor for drastic cuts in the U. S. defense program will be even louder than at present.

But whatever Russia's current objectives may be, its control of Czechoslovakia is assurance that the communist forces will always have easy access to one of Europe's finest arsenals.

Czechoslovakia has been Europe's arms specialist since the old Austro-Hungarian Empire was broken up in 1919. Under the Treaty of St. Germain, the new Czechoslovakian Republic gained about 90 pct of Austro-Hungarian armament industry.

### Added War Plants

During World War II, the Germans built up the Czech war plant capacity substantially, adding 17 ammunition and 47 weapons factories.

It is estimated that in 1945 the Czechs had 117 major war plants employing about 1.7 million workers. Among the facilities which the Russians inherited are the famed Skoda Works at Pilsen, the Janecek plant at Prague, and the Zbrojovka factory at Brunn.

Unlike the U. S. and its allies, the Czech plants did not convert to civilian production at the end of the war. Instead a rearmament program was started in order to re-equip the Russian army and the satellite forces of Poland, Bulgaria, Hungary, Rumania and Albania, as well as Czechoslovakia.

Though no reliable estimates of Czechoslovakia's current arms production are available, the rated capacity of the Czech ordnance industry in 1944, when it was under the direction of Herman Goering, does give an indication of the country's formidable weapons ca-

pacity. Output for that year, before shortages slowed production, was:

Artillery shells, above 37 mm, 68.4 million; rifle and light artillery ammunition including 37 mm, 1,536 billion; land mines, mortar ammunition of all calibers, 33.6 million; air force bombs of all types, 15.6 million; light artillery pieces, 32,400; rifles, light ma-

been stopped, but output of .45 cal tommy guns has been upped.

Ammunition of all kinds through 24 in. shells is being made, as well as bombs and land and sea mines.

Although the Czechs have not been manufacturing tanks, at Vitkovice they are making "split" armor for the heavy Russian tanks. This type of construction consists of several steel plates separated by layers of a special type of asbestos which is said to reduce bazooka penetration.

None of Czechoslovakia's seven aircraft factories produce combat planes, but make MIG parts.

There have been no reports of Czech-made weapons being used in

### Location of Czech Defense Plants



chine guns, pistols, 3,732 million; heavy machine guns and other assorted armament, 43,200.

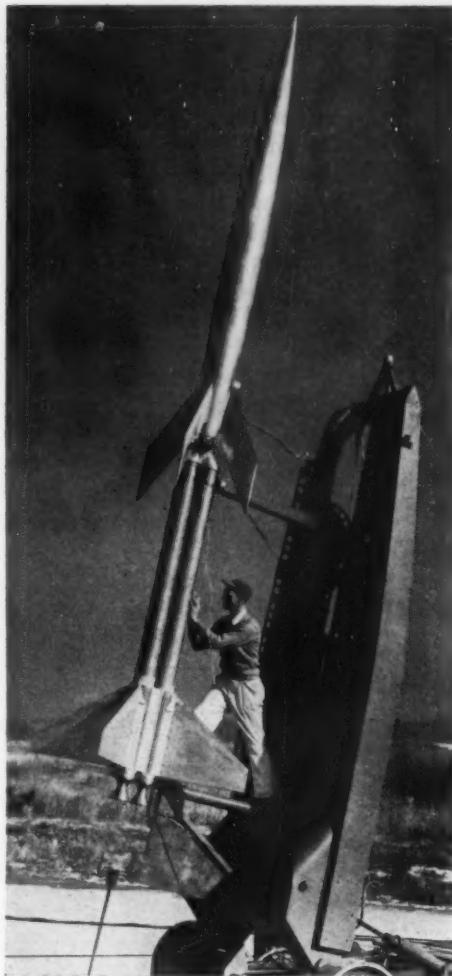
Main weapons being turned out at present in Czech plants are 16 mm aircraft machine guns, an improved line of Czech-German 88 mm field pieces, and 120 mm and 128 mm AA and antitank guns.

As a reflection of Russia's disdain for the bazooka, Czechoslovakia is not producing any of these units. However, it is manufacturing large quantities of 30 mm Katuskas (rockets for artillery divisions) and German-type V-2 rockets. Production of light machine guns is reported to have

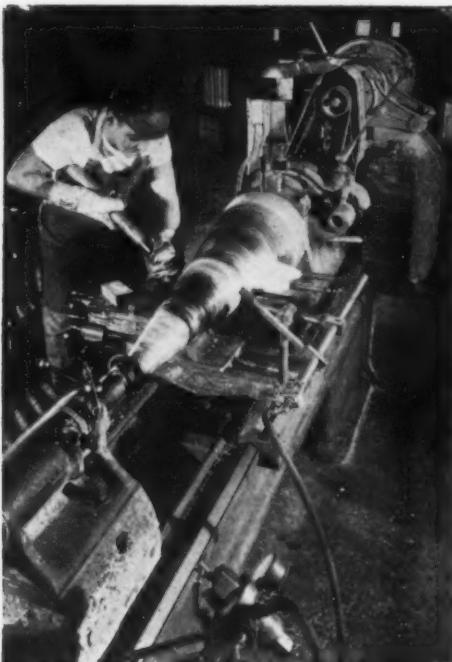
Korea, but since 1951 there have been large shipments of Czech arms to China. These shipments for the second half of 1952 were valued at \$51 million.

IRON AGE sources have learned that at least forty 210 mm guns were sent to China last year, apparently to bolster coast defenses. In addition, the Chinese also received a fairly large shipment of 88 mm and 120 mm AA guns and AA rocket batteries.

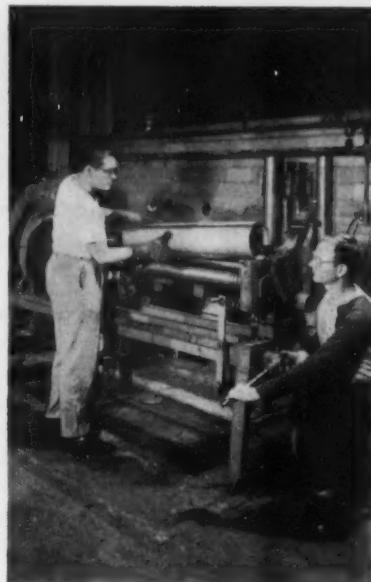
Since the start of this year, armament production in Czechoslovakia is reported to be falling off, and thousands of workers have been transferred to civilian plants.



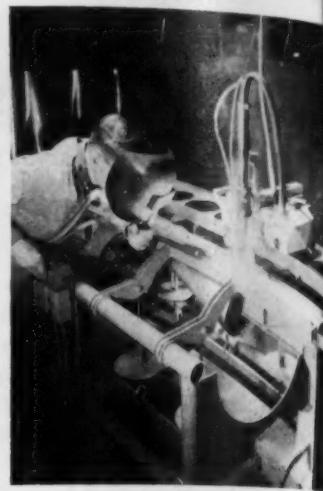
READY-TO-LAUNCH rocket at Wallops Island has booster attachment. Its instruments will telemeter information to ground station.



MAGNESIUM alloy tube is worked hot on spinning lathe. Metalsmith uses double torch in shaping shell casing.



HOT FORMING rocket shell (at left) from thin flat magnesium sheet uses pinch rolls. Once sheet,  $1/16$  or  $3/32$  in. thick, has been rolled welder above joins edges on inert-arc welding machine.



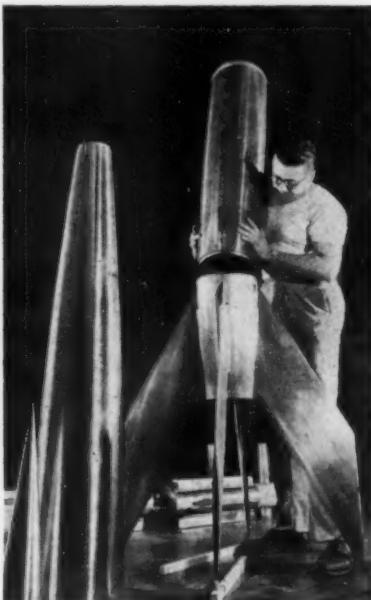
HOT FORMING rocket shell (at left) from thin flat magnesium sheet uses pinch rolls. Once sheet,  $1/16$  or  $3/32$  in. thick, has been rolled welder above joins edges on inert-arc welding machine.

## Magnesium Rockets Probe Skies

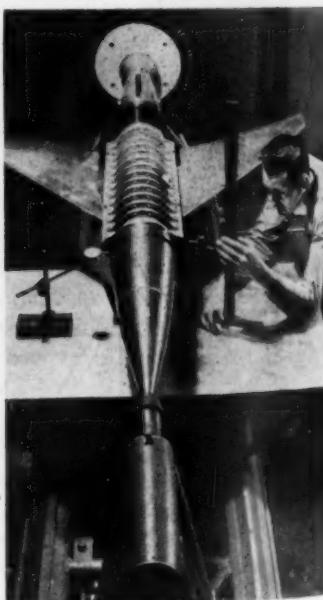
Rocket models with magnesium alloy shells traveling at supersonic speeds probe for secrets of aerodynamics in Virginia skies. The rockets are fired by National Advisory Committee for Aeronautics' air lab.

Within the magnesium alloy shell delicate electronic recording equipment relays information gathered during flight to ground receiving station. Launching site for the rockets is at the NACA Wallops Island, Va., field station.

Aerodynamic information gathered at this and other test sites—at high altitudes and supersonic speeds—goes to help designers of airplanes and missiles. Magnesium alloy sheets are used in these research models because of light weight, workability, and structural factors.



SHELL sections are assembled for check on dimensional accuracy. Tail fins are hollow cast magnesium, welded to shell.



IN THE LAB shell is set up for check on dimensional accuracy. Errors can lessen value of research information.

# BARS: Tight Market Till Year End

Cold-finished bars tightest, hot-rolled little better . . . Shell program adds demand . . . Raw materials, heat-treating space short . . . See some signs of hope—By K. W. Bennett.

Cold-finished bars will stay tight through most of the year if producers are reading their cards correctly. Hot-rolled bars will be in little better shape.

Already running 4 to 10 weeks behind on deliveries, cold-finishingers are watching the expanding shell program with doubt that they'll be able to fill demand before the end of the year.

Their production soared to 1,922-205 tons in 1952 and producers speak of a 2-million-ton year in 1953. Peak thus far was 1,935,823 tons in 1951 when production was unhampered by strikes.

### Alloy Also Tightens

As mills began third quarter booking of bars last week, demand indicated that most quotas would either hold steady or be cut slightly. There was a recent increase in alloy bar quotas, but even that commodity has begun to tighten. A number of producers believe that cold-finished bar supply will grow tighter in the next 2 or 3 months.

Cold-finishingers find raw materials still their major problem. One mill is half a month's tonnage behind in hot-rolled bar deliveries. Another hopes to be current "by the end of third quarter," but indicated this is a hope—certainly not a promise. Quotas offered are not greater, and an increased military set-aside for shell billets would have the effect of actually cutting quotas.

### Furnaces All Tied Up

Even with raw materials in his plant, the bar finisher's troubles aren't over. One firm with finishing capacity booked through third quarter reports its heat-treating furnaces are tied up for the rest of the year. Another has frankly called quits—he'll cold-finish, but won't offer heat-treating capacity.

Effect is a minor conversion arrangement. You can have bars cold-finished, but then it's up to you to locate heat-treating space. Others point out that they are accepting bar—though it will be delayed at the heat-treat stage.

Demand seems general. Ware-

has been promised an increase "sometime in the third quarter." As mentioned above, one mill had planned a 30 pct hike in alloy bar allotments, though carbon steel bars with the same mill remain tight for third quarter.

Some cold-finishingers report they'll be current on delivery in third quarter despite the furnace shortage. Others, making no promises, nevertheless have been shortening delivery time every month since January.

Backing this up: Total bar shipments dropped in February (a

### Republic Raises Steel Extras

Early this week Republic Steel Corp., third largest steel producer, raised prices of extras on carbon steel bars. The company said increases ranged from  $\frac{1}{8}$ ¢ to  $\frac{1}{4}$ ¢ per lb. That would be equivalent to \$2.50 to \$5.00 per net ton.

The increases in extra charges were made to compensate for past cost increases not covered by the 4.7 pct price increase permitted by the Office of Price Stabilization last summer. At that time steelworkers were granted a wage package costing approximately 25¢ per hr per employee.

Republic's revisions of bar extras were not across the board. A few products were unaffected, some extras were shaved slightly. Increases will be felt mainly in carbon bars.

Extra charges, which account for about 25 pct of total steel cost to consumers, reflect extra material, work, or time in processing the steel to consumer specifications.

The price action by Republic is the first move by a major producer, since price controls ended, although at least three other leading steel officials have indicated need for higher prices. Other increases both in extra charges and base prices may be expected. It had been anticipated that extra charges would be first to change. Other steel producers are known to be studying their extras closely. (See p. 171.)

The steel price situation is not likely to be fully clarified until the seventh round wage question is settled—perhaps by June.

houses and automakers are exerting heavy pressure. Farm equipment manufacturers continue to consume fair amounts of cold-finished bars, but here demand has begun to reflect previously reported caution in this field. While still interested in balancing inventory, an increasing number of reports indicate the farm buyer's fevered purchasing of fall and early winter has dropped off.

Despite pessimism on late 1953 cold-finished bar supply, there are a few signs of easing in the strain. In some instances, bar capacity has been boosted. A billet user

short month). February shipments of cold-finished carbon bars were 161,919 tons.

This still puts the 1953 monthly average above the 160,183-ton average shipped monthly in 1952, and well over the record 161,318 ton average for 1951. Monthly average shipped in 1950 was 135,087-tons, and the year before a low 101,087 tons. Hence if shipments began to dip slightly 2 months ago, they still have a long slide before hitting pre-Korea levels. And general opinion is that this won't happen in 1953.

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prescription glasses—  
use standard 50 mm. round lenses*

They offer many benefits to workers in hazardous occupations—

**improved design** . . . provides snug, comfortable fit—ample room over modern, large-frame prescription glasses.

**nylon eye cups** . . . molded of tough lightweight nylon—strongest plastic used in goggle cups; non-flammable—and won't conduct heat.

**standard lenses** . . . 50 mm. round flat Super-Tough® lenses used eliminate need to stock odd size replacement lenses—external lens retaining ring makes lens replacement quick and easy.

**extra ventilation** . . . two-way ventilation is provided by slots in retaining ring and screens in eye cups.

**new lightweight comfort** . . . total weight of these new goggles is practically the same as smaller "cover all" styles.

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## Power

### ATOMIC ENERGY

Industry planning commercial development of atomic energy when AEC eases restrictions

The slow thaw of Atomic Energy Commission's monopoly on the atom will soon accelerate to a definite loosening. It will then permit industry to put more time and money into developing commercial applications for nuclear fission.

Looming large in industry sights is the atomic-fired power plant—but predictions of how soon this will be feasible depend on whose crystal ball you're using. Some say 5 years or less, others say a competitive power plant is 30 years away.

#### Form Private Group

But the atomic industry is at least in a formative stage. Incorporation papers are on file in New York State for a group to be known as the Atomic Industrial Forum, Inc.

Avowed purposes of the group are: (1) To foster development and use of atomic energy in free competitive enterprise. (2) To provide a meeting place for resolution of problems. (3) To act as a clearing house for information. And (4) to encourage research.

Once the staff is well organized, it will have four phases: (1) Technical and engineering, (2) economic and commercial, (3) legal, and (4) management. It will collect and disseminate information to aid in the solution of problems arising in the new industry.



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—standard on Willson Kover-Mor Goggles. Makes them easier to handle—holds them firmly in place.

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## Industry Gets Set

It's pointed out by the founders that industry is better suited than government to the task of developing the many opportunities sure to be found when atomic energy is opened to free competition.

Power plants, while far from being the only use for atomic energy, far overshadow in magnitude all others that can be foreseen at the present. But byproducts, such as plutonium and possibly others, would become important in the economics of nuclear industry.

Leaders in the field envision power plants fired by breeder-type reactors. These would not only produce their own fuel but a surplus of plutonium as well.

Possible uses would be weapons for the government, fuel for starting up new power plants and high-grade fuel for utilization reactors, such as propulsive units in military craft or merchant vessels.

Directors of the newly formed organization are quick to point out that the President's Materials Policy Commission estimated a growth by 1975 in electricity needs of 2½ times 1950 requirements.

### Management

#### Frank Purnell, 66, Dies

Frank Purnell, 66, Chairman of Youngstown Sheet & Tube Co., died Apr. 19 following a cerebral hemorrhage suffered 3 days earlier. Mr. Purnell last month announced his decision to retire Apr. 28.

He began his steel career as a \$12.50 a month hall boy with Sheet & Tube 51 years ago. During World War I he was assistant director of steel supply in Washington, serving under Bernard Baruch. After the war he became vice-president of Consolidated Steel Export Corp., and in 1922 he became head of Bethlehem Steel Corp.'s Export Div.

Returning to Youngstown Sheet & Tube in 1923, he was a vice-president until 1930 when he became president. He retired as president in 1950 to become the company's board chairman.



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### COMPARISON TABLE

#### SAND CORES

Disintegrate under rain or prolonged exposure to moisture.  
Must be handled carefully.  
Some variation in size of cores and openings.  
Eroded to varying degrees by stream of molten metal. Holes frequently enlarged as metal is poured.  
Eroded sand sometimes carried into casting by molten metal.  
High percentage of breakage.  
Require hand reaming or cleaning of holes.

#### AlSiMag STRAINER CORES

NOT AFFECTED by water.  
STRONG, stand fast, rough handling.  
UNIFORM in all dimensions.  
NOT AFFECTED by stream of molten metal at normal pouring temperatures. Hole sizes remain uniform throughout pouring.  
NON-SPALLING under normal metal pouring temperatures.  
VIRTUALLY NO BREAKAGE.  
Clean, accurate, ready to use.

One foundry using 500 strainer cores per shift made a careful check on their costs of making sand cores. They thought their sand cores cost them practically nothing. They found that cost, including breakage, was 3c each.

The original cost of the AlSiMag core was less . . . and they got big dividends in faster handling, better castings, cleaner castings. If you will accurately check your own costs we believe you too will find that AlSiMag cores save you money! Samples and prices on request.

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51ST YEAR OF CERAMIC LEADERSHIP

## ACCIDENTS: Aim Truer with Rifle

**Sharpshooting at safety bullseye better than blasting it with shotgun . . . U. S. Steel uses big management approach to determine accident causes, eradicate them—By J. B. Delaney.**

U. S. Steel Corp. finds the rifle better than the shotgun for hitting the safety bullseye.

In 4 years, the sharpshooting technique has reduced accidents in U. S. Steel plants by nearly 60 pct. Lost-time accidents are off over 45 pct.

Dan Farrell, U. S. Steel's safety supervisor, says that under the program scientific management principles are applied to safety. Techniques that might be used to streamline and simplify a financial or production organization are turned to the protection of steel plant workers. It's the big management way of attacking a problem that is too often unsystematically treated.

### Reporting the Accident

Starting point is the accident report. As these reports are received and analyzed, unsafe acts are classified according to occupation. Then, a simple tabulation is made of safety brodies responsible for injury in each occupation involved.

The accident picture is now taking form. When it is brought into focus, the safety experts write the directions needed to avoid or minimize accidents. U. S. Steel calls it the "Single Objective" approach—hitting the targets one by one.

Here is how one accident was classified and plotted:

The foreman reported that a man had burned his hand when he touched a hot bar while picking it up to place it on a pile. The occupation was classified as "Piler"; activity involved was touching a hot bar; part of the body injured was the hand. This breakdown of accident facts is entered into the "Awareness Chart."

As the evidence and statistics accumulate, the critical situations are easily spotted. In the department from which the above exam-

ple came, the unsafe acts centered around four of the 19 occupations and concerned only eight acts. Of the eight acts, those occurring most frequently involved piling, bar rolling off pile, striking against pile, touching hot bars, and catching hand between bars. Parts of the body injured were noted in each case.

### Solve Accident Cause

The Awareness Chart showed 17 injuries to feet or legs because the top overhanging bar had been falling off the pile before it was keyed in by the next layer. Doing away with this accident cause was simple. Insertion of a small wooden block to support the overhanging bar until it was keyed in did the trick.

Although answers to the other unsafe acts were just as simple, they were found only after on-the-job study pinpointed the cause. Action could be taken either through use of protective clothing, change of job method, or modification of equipment.

Awareness Chart procedure leads in to development of a Control Chart to determine whether the objective is accomplished or whether further action is needed.

To enable foremen and other supervisors to anticipate accident situations, the program is carried one step further through analysis that determines three main causes of accidents: (1) Caught between, (2) stuck against, (3) and struck by. All jobs are studied to eliminate or guard against accidents that might develop from the three causes—a form of "preventive medicine."

Farrell believes the next major gain in dealing with safety lies in the application of scientific analysis of specific jobs.

These phases of U. S. Steel's safety program, says Farrell, are only the groundwork for a major over-all plan that he expects will require many years to evolve.

"We learned long ago," he says, "that effective safety programs cannot be spontaneous, overnight procedures but must be built carefully and exactly as a fine time piece or any other dependable apparatus."

### AEC's a Safe Place to Work

Handling hot atoms for the Atomic Energy Commission has become still safer. In 1952 the injury rate in the nation's atomic energy program fell by one-third, says AEC proudly.

Here's how AEC sees it. Atomic plant injuries last year happened at a rate of 2.51 per million employee hours—or 33.3 pct below the rate of 1951. Match this to the rate for all American industry which according to latest National Safety Council figures stands at a comparatively frightening 9.06 injuries per million employee hours.

AEC is not gloating. Citing these statistics is merely a continuation of its campaign to dispel the layman's fear of deadly radioactive material.

Atomic energy operations contractors last year set a rate of 2.29 employees hurt per million man-hr., against 2.69 in 1951. The NSC rate for the chemical industry, nearest one comparable, was 5.48 in 1951.

While construction man-hr. last year rose 80 pct, the injury rate was 2.71—47 pct below 1951.



## SKILLS: How's Your Training Program?

**Well planned program needed to assure skills . . . Should be measured against production needs . . . Responsibility should be clearly fixed . . . Several aids may help you.**

Industry's shortage of skilled labor is both chronic and constant. It is chronic to the extent that it reflects skill needs of cyclical production. And it's constant to the extent that progress means change in skill requirements.

For this reason it's a good idea for every firm to take stock from time to time of its own program in assuring skills to meet changing production needs. The need is more acute during time of industrial expansion for war or defense, because expanded production requires new and additional skills—at the same time well-trained workers are exchanging tools for guns.

### Time is Vital

Advantage of a long-range training program is better appreciated when one considers the time needed to turn out skilled workers. This may vary from a few months to several years. There is seldom time to start meeting skill needs from scratch when production requirements become known. Efforts to overcome skill deficits in the workforce during periods of emergency production result in lavish advertisements promising everything but a vice-residency to engineers, draftsmen, tool and die makers, machinists, and machine operators. As key men are decoyed by big promises, charges and counter-charges of labor pirating often result.

### Plan for Replacement

A training program cannot prevent your skilled workers from entering the army or going to another firm. But it can provide a systematic method of skill expansion and replacement in your work force.

As in any management function, organization is a prime requisite. Training is usually a staff func-

tion with fixed responsibility. Person in charge of training may be responsible to the official in charge of production, or, if the program covers all employees, he may be responsible to official in charge of personnel.

### Spell Out Duties

In either event he must have clear cut instructions as to his responsibilities and authority. And he should have assurance of interest on the part of top management.

Formation of a training program is best done by analyzing skilled labor supply and demand. Production skill needs are estimated in advance. Current work force is evaluated, with allowance made for attrition. The deficit is your replacement or training requirement.

Since training is an expensive proposition, most firms also require some analysis of prospects for hiring qualified new workers. But experience with job hoppers and other hiring disappointments have caused some management people to view training costs differently.

Selection of workers who are to receive training should be done carefully. Collection of aptitude data, if not already a standard practice, should be undertaken. To augment this it has been found helpful to post training openings and qualifications, so that interested employees may bid for advancement.

It is good for employee morale to promote from within the organization whenever possible.

Actually skill training should be on the job if possible. If this isn't possible it should be as close to the job as can be arranged.

### Work With Schools

Where large numbers of skilled workmen need to be trained, a more formal schooling system must be organized. In such cases some companies have obtained good results working closely with local vocational schools (THE IRON AGE, Jan. 22, p. 37).

Free advice on setting up a training program for skilled workers may be obtained from Department of Labor's Bureau of Apprenticeship. The Bureau has some 300 representatives, themselves skilled craftsmen, who are available for consultation with industry. The Bureau has also published several pamphlets on apprenticeship and job training.

## What's Your Job Training Score?

### Have You:

- (1) Estimated skill requirements in line with production?
- (2) Made one person responsible for training and backed him up?
- (3) A training program for supervisors?
- (4) Picked workers who are qualified as job instructors?
- (5) A regular training program for apprentices?
- (6) Made an inventory of employees skills and aptitudes?
- (7) A program to improve job skills? For new employees, too?
- (8) Checked to see what help local vocational schools can give?
- (9) Encouraged employees to further education and job skill?
- (10) Given employees a chance to contribute to training?
- (11) Included safe work practice in your training?
- (12) Checked with Bureau of Apprenticeship for help?

## Expansion

### Metal Powder:

Capacity to rise 200 pct . . .  
Assn. holds Cleveland meet.

Progress was a meaningful word to metal powder executives gathered in Cleveland this week for the ninth annual meeting of the Metal Powder Assn. Compiled by the association, a survey showed that by mid-1953 iron powder producing capacity in the U. S. and Canada will be almost 200 pct over capacity at the start of the year.

The survey also revealed that 59 pct of present output was going into bearings and mechanical parts, 28 pct to scarfing, 10.5 pct for electronics uses, and smaller percentages for other uses.

Speaking on the permeameter, an electronic testing device made by the National Bureau of Standards, G. P. McKnight, of Speer Carbon Co's Resistor Div., said that after more development the instrument will be a must for all electronic testing labs.

Designed to measure directly the permeability and "Q" of iron powder electronic cores, the permeameter offers a shortcut in testing the

magnetic characteristics of iron powder cores, he said.

Bernard Goldsmith, president of Essex Electronics, said that design requirements for military and civilian iron core inductors follow the path of miniaturization. Growing demand for television sets has broadened the field of application.

Representatives of National Cash Register Co. indicated that today the company has more than 90 iron powder parts in production and over that number being tooled up for production. National Cash Register is now making over 700,000 parts a week.

Wilson N. Pratt, of American Metaseal Mfg. Corp., described the benefits of the impregnating process developed by his company. For such parts where sintered metals are needed but where natural porosity is unwanted, "filling" the pores is the answer.

All porosity is filled by Metaseal with a solid copolymer and excess resin is removed from the outside of the part with an emulsion type cleaner that does not attack the impregnant. Corrosive action is resisted and plating is possible without spotting out, freckling, or blistering.

## Defense

### Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Synchros, 10000 ea, \$537,200, Electro-Mechanical Corp., Old Greenwich, Conn.

Powder tanks, 3000 ea, \$299,970, Beatrice Steel Tank Mfg. Co., Beatrice, Neb.

Aluminum sleeve, 350000 ea, \$568,180, The New Britain Mach. Co., New Britain.

Wire, arming, assy, 241000 ea, \$50,510, Eastern Tool & Mfg. Co., Belleville, N. J.

Holder, increment, 711000 ea, \$24,570, Easter Tool & Mfg. Co., Belleville, N. J.

Head, assy, MPTs for rocket 3.5", 1000 ea, \$34,980, S. W. Arber, Inc., New York.

Gear, and gear assy, 18000, \$44,000, Borg Warner Corp., Muncie, Ind.

Booster, malleable iron body, 537000, \$488,670, The Shaible Co., Cincinnati.

Shell, HE, 155 MM, 27000, \$4,605,300, Minneapolis-Moline Co., Louisville, Ky.

Stutzke.

Shell, illuminating, 149000, \$3,707,120, Temco, Inc., Nashville.

Fin, shell, M3, 1050000, \$514,500, The Schaeble Co., Cincinnati.

Jack-box assys, 5400 ea, \$61,204, Palmer Electric & Mfg. Co., Wakefield, Mass.

Heat, 3.5" rocket, 550000, \$34,964, U. S. Steel Co., Pittsburgh, G. M. Hultz.

Metal parts for motor assembly 12' rocket, 900000, \$92,707, U. S. Steel Co., Pittsburgh, C. M. Hultz.

.50 Cal. metallic belt link, 125000, \$8,539, Fort Pitt Mfg. Co., Pittsburgh.

Parts for 20 MM gun, 600, \$61,600, Crown Cork & Seal Co., Inc., Baltimore.

Fuze, time, 700, \$242,900, Precision Casting Co., Syracuse.

Shell, HE, 124000, \$508,400, Faaco Industries, Rochester.

Primer screw assy, 4710000, \$51,000, H. & H. Screw Products, Buffalo.

Replenishment of hardware, neg, 70000, \$39,268, The Cleveland Chain & Mfg. Co., Cleveland.

Replenishment of small arms parts, 2600, \$57,356, Powertone Corp., Milford, Mich.

Replenishment of tank & combat vehicle parts, 3700, \$217,375, Motor Wheel Corp., Lansing, Mich.

Replenishment of tools, \$82,029, Chain Link Fence Corp., Chicago.

Replenishment of other vehicle parts, 40000, \$147,960, Stewart-Warner Corp., Chicago, E. N. Osterberg.

Replenishment of other vehicles parts, 52000, \$126,051, Stewart-Warner Corp., Chicago, E. N. Osterberg.

Replenishment of other vehicle parts, 15000, \$388,030, General Motors Corp., Detroit, R. C. Campbell.

Replenishment of hardware, 26300, \$218,838, The Timken Roller Bearing Co., Canton.

Replenishment of other combat vehicle parts, 55300, \$195,105, United States Rubber Co., Fort Wayne, Ind., W. H. Streetor.

Replenishment of small arms parts, 2000, \$55,900, Atlas Industries, Inc., Woodville, Ohio.

Replenishment of small arms parts, 724, \$333,575, James Cunningham Son & Co., Rochester.

Trucks, fork, 149, \$1,121,160, Clark Equipment Co., Buchanan, Mich.

Picks, railroad, 46500, \$83,700, True Temper Corp., Cleveland.

Machine grinding, 3, \$55,213, Norton Co., Worcester, Mass.

Airspeed Indicators, 3391, \$117,212, The Lackner Co., Cincinnati.

Ground portable engine, \$1,063,251, Land-Air, Inc., Chicago.

Welding machines, 6, \$125,818, Schikey Bros., Inc., Chicago.

Trucks, fork lift gasoline, 34, \$132,362, Towmotor Corp., Cleveland.

Portable electric floodlights, 158, \$154,595, Hamelito Corp., Port Chester.

Bayonet knife M4, 166098, \$468,678, Camillus Cutlery Co., Camillus, N. Y.

Valve, gate, 8 ea, \$90,345, The Chapman Valve Mfg. Co.

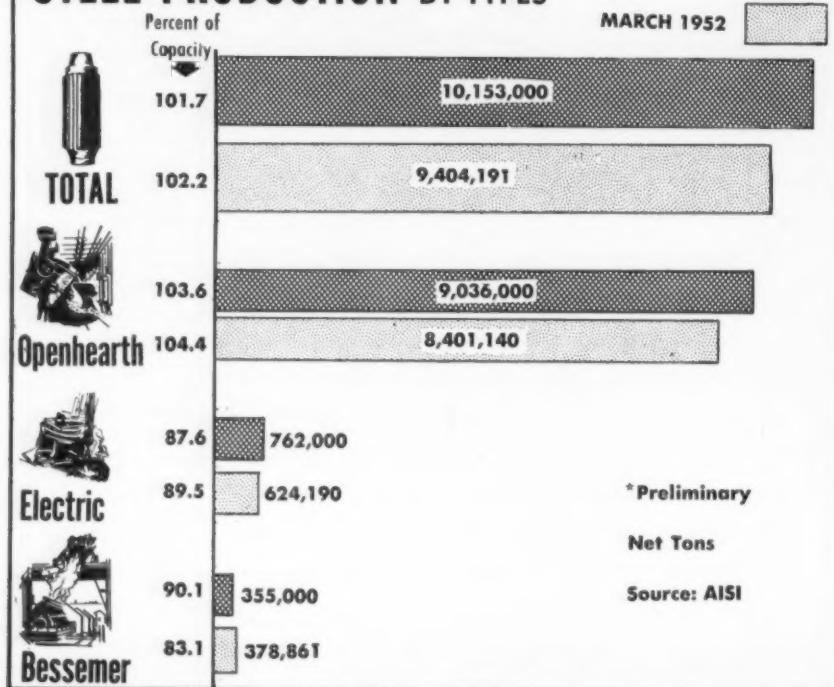
Container, ammo, metal, 7429000, \$380,703, American Can Co., New York.

Container, ammo, metal, 5484000, \$251,486, American Can Co., New York.

Breech ring forging, rough machined, 1819, \$1,063,496, Cameron Iron Works, Houston.

Marker, minefield, 242115 ea, \$64,403, McCauley Safety Products Corp., New Hope, Pa.

### STEEL PRODUCTION BY TYPES



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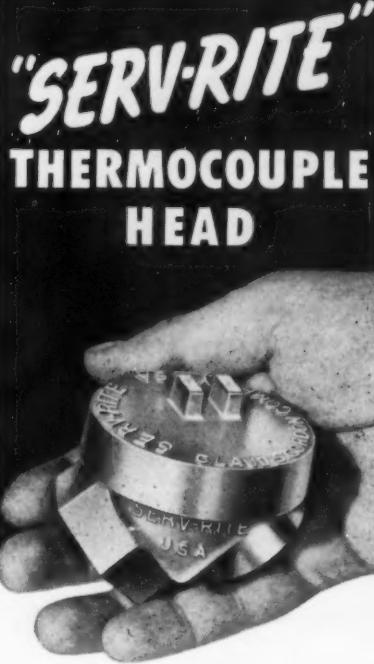
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This new "Serv-Rite" thermocouple head is actually small enough to be held comfortably in the palm of your hand. But size is only one of the many features that make this thermocouple head really extraordinary. It is loaded with installation and service conveniences that any user of thermocouples will appreciate at once.

The body is of malleable iron, cadmium plated for durability. A new type friction lock assures easy removal or tightening of the cap — a quarter turn does it. An asbestos gasket makes the head dirt- and moisture-proof. With a choice of  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", or 1" IPS opening for the protecting tube, you can standardize on one style head.

The connector block is of a material especially selected to withstand, without damage, temperatures up to 900° F. in continuous service. Improvements over the conventional type of inserts greatly simplify the making of the lead wire connections. The complete thermocouple element, including connector block, can be easily withdrawn for inspection.

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## Industrial Briefs

Distributor . . . ENTHONE, INC., New Haven, Conn., has appointed R. O. Hull & Co., Cleveland, as exclusive distributors of Enthone products in Ohio, West Virginia, the western portion of Pennsylvania, part of western New York including the Buffalo area, and northeastern Kentucky.

Sales Office . . . THE DOW CHEMICAL CO. has opened a new sales office in Minneapolis.

Blooming Mill . . . GRANITE CITY STEEL CO. completed its new 46-in. blooming mill at Granite City, Ill., recently.

Branch Office . . . EUTECTIC WELDING ALLOYS CORP., Flushing, N. Y., has established an Eastern Divisional office at the Industrial Bldg., 1060 Broad St., Newark, N. J.

Receives Orders . . . SOLAR AIR-CRAFT CO., San Diego, Calif., has received orders totaling more than \$6 million to build parts for two of the nation's newest jet engines.

Atomic Lab . . . AMERICAN CYANAMID CO., New York, is operating a new Atomic Energy Commission Laboratory in Winchester, Mass. Primary objective is the development and improvement of processes for the recovery of uranium from its ores.

Honored . . . AMERICAN SOCIETY OF MECHANICAL ENGINEERS honored William O. Hildreth, 88, with a citation for 65 years' membership in the society, recently. He was one of eight engineers in the U. S. to receive the citation.

New Home . . . TOPPER EQUIPMENT CO. recently completed and moved into a new and modern manufacturing plant at Rahway, N. J.

Louisville Warehouse . . . BRIDGEPORT BRASS CO. will open a new warehouse at 2209 S. Floyd St., Louisville, next month.

Prize Winners . . . Two Los Angeles AIRESEARCH MFG. CO. apprentice moulders won the first and second prize honors in the national moulding contest for apprentices sponsored by the American Foundrymen's Society and judged by the University of Illinois. Joseph Lo Patriello won the top award and Carlo Gonzales won the second prize.

Feldspar Expansion . . . INDUSTRIAL MINERALS DIV., International Minerals & Chemical Corp., is constructing a new feldspar grinding facility at Erwin, Tenn. Facilities will increase capacity for F-4 pottery grade flotation feldspar by about 50%.

President Elected . . . AMERICAN STEELWAREHOUSE ASSN. has elected Frank B. Stewart, district manager, U. S. Supply Div., U. S. Steel Corp., president of the Northern California Chapter.

African Resources . . . KERR CO., Engineers, has extended its services to Africa. Examination, appraisal and development of all types of African natural resources will be undertaken. John E. Kelly, consultant on natural resources, will head the new service.

Cool Water . . . THE COLORADO FUEL & IRON CORP. is erecting a gigantic cooling tower to cool all water used in the operation of the powerplant at its Pueblo, Colo., plant.

Merger Completed . . . Merger of Luscombe Airplane Corp. with and into TEMCO AIRCRAFT CORP. has been completed. Luscombe will now be known as the Garland plant of TEMCO.

Exclusive Basis . . . STAMCO, INC., New Bremen, Ohio, has appointed Luther & Pedersen, Inc., 565 W. Washington Blvd., Chicago, as its exclusive representative in Chicago and Milwaukee territories.

Silver Anniversary . . . LEAD INDUSTRIES ASSN. celebrated its Silver Anniversary at The Greenbrier, White Sulphur Springs, W. Va., with a meeting of about 130 representatives of lead mining companies and consumers of lead.

Champagne or Cigars . . . J. A. Sisto, chairman, BARIUM STEEL CORP., bet Larry Arnold, of A. E. Anderson Construction Corp., Buffalo, a champagne dinner against a box of cigars that Barium's Chester Furnace couldn't be relined and rebuilt in 60 days. Mr. Sisto paid the bet to 60 people when the job was finished in 58 days. He hopes to cover his bet with 15 to 20 per cent higher production from improved furnace.

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# The Automotive Assembly Line

## Give The Customer What He Wants

**Automakers seek out public reaction to new cars . . . Opinions guide designers, help beat competition . . . Driver objections can bring changes during production—By R. D. Raddant.**

Detroit's automotive brass has never thought its customers were stupid. Substantial amounts of time and money are spent every year to find out just what Mr. Average Motorist thinks of his new car. His opinions are carefully collected, tabulated and weighed.

Up to a point, the car owner comes close to being the final arbiter in many automotive decisions. But beyond that point, the experts take over.

**Group Plans . . .** As one styling expert put it, "We can't use public opinion too much in styling except to get an idea what the public likes. Beyond that his opinion isn't valid because he can't see what we are doing."

Final styling decisions are made by a group of top executives, and a rather broad group at that. Historically, most styling flops can be traced to one-man decisions.

**Who's He Like? . . .** Most auto companies make wide studies of public opinion of their own products and those of their competitors. What the public thinks of the competition may be as valuable to an automaker as studies of his own cars.

Public opinion research was once used to explore long term trends in styling. Now it is generally used to measure consumer acceptance.

**Not Designers . . .** Roland Withers, director of customer research at General Motors, points out that his section is not asked to design cars but to evaluate opinion. "We can find the boundary lines on how far we can go in a given direction," he explains.

Public opinion studies have other practical aspects. Sometimes one automaker can evaluate public reaction to a competing car, then capitalize on this knowledge.

**Change It? . . .** After a model is introduced, public reaction can be used in other ways. If some feature of design is not going over, it can possibly be changed.

On the other hand, research sometimes shows public dislike, but too late for change. Or management may be convinced this bad opinion is based on misconception or misunderstanding. Then the producer can call in his public relations and advertising boys to "educate" the public.

<b>GM HYDRAULIC STEERING</b>		
Does your Oldsmobile have this feature?		
<input type="checkbox"/> YES	<input type="checkbox"/> NO	
How would you rate it?		
<input type="checkbox"/> GOOD	<input type="checkbox"/> FAIR	<input type="checkbox"/> POOR
<b>PEDAL-EASE POWER BRAKE</b>		
Does your Oldsmobile have this feature?		
<input type="checkbox"/> YES	<input type="checkbox"/> NO	
How would you rate it?		
<input type="checkbox"/> GOOD	<input type="checkbox"/> FAIR	<input type="checkbox"/> POOR
How would you rate the Parking Brake?		
<input type="checkbox"/> GOOD	<input type="checkbox"/> FAIR	<input type="checkbox"/> POOR
<b>HYDRA-MATIC SUPER DRIVE</b>		
Is your Olds equipped with Hydra-Matic Super Drive?		
<input type="checkbox"/> YES	<input type="checkbox"/> NO	
How would you rate it?		
<input type="checkbox"/> GOOD	<input type="checkbox"/> FAIR	<input type="checkbox"/> POOR
Comments.....		
SAMPLE PAGE of a booklet asking new Oldsmobile owners to rate appearance, features, mechanical devices of the auto. Questions on quality of dealer service and personal statistics are also included.		

**Keep It Secret . . .** Like almost everything in the auto industry, public opinion study techniques are well guarded. Some make all their own studies and others call in research services. Techniques for developing mailing lists are also guarded jealously.

Many surveys that go out in direct mail do not go out under the parent company's own name. Research specialists are convinced that a more objective answer can be obtained in other ways. They are not worried about the comment being too critical.

**Uncensored . . .** Other firms do identify themselves. Oldsmobile sends out a detailed questionnaire to every Olds buyer with a friendly note from General Manager J. F. Wolfram urging frank answers.

In multiple choice questions, the owner evaluates his Oldsmobile on appearance, interior, seat comfort, and performance in more than 40 questions. Space is also provided for comment. Mr. Wolfram sees a certain number of these replies every day and care is used to see that he gets them directly.

A wide difference of opinion exists over the value of personal interviews as opposed to direct mail. GM uses both but relies more heavily on direct mail. Chrysler, however, feels that the personal interview obtains the best results.

**Under Wraps . . .** Nothing causes more talk in Detroit than an unauthorized look at an engine under test by one of the auto companies.

A large buzz of conversation originated last week when word got out about one engine which Packard is considering as a 1955 powerplant.

What caused the raised eyebrows was the engine's construction: the V-8 has been created by two separate engine blocks of four cylinders each bolted to a common crankcase.

**For Sale or Test? . . .** First conclusion jumped to was that this

construction could be machined at least in part on the company's present tooling without resorting to all the major expense entailed by changing from in-line to V-8 tooling.

The second explanation, probably more valid, was that this type of construction might be expedient just for test engine purposes. In other words, it would provide an inexpensive method of building a test engine that could be valid for testing design, but not necessarily for production.

### Crankcase a Stamping

Unusual design features included a crankcase that is a stamping, not a casting, a large number of die cast magnesium parts, including the oil pan, rocker box cover, gear case and other similar parts, and dual exhaust.

The fact that these details were observed on one engine does not mean that this is the engine that Packard intends to use when the switch to V-8 is made. But these are features that are under test, for what it's worth at the moment.

It was also noted that in concept the engine showed features similar to aircraft engine design. For example, cylinder blocks bolted to the crankcase have been used in aircraft engines. Extensive use of magnesium is also an aircraft engine similarity.

### Auto Labor Peace Returns

Labor peace returned to the auto industry last week after minor strikes involving no more than 2500 workers had idled close to 80,000 others in Ford and Chrysler plants.

In the Chrysler dispute, 300 truck drivers returned to work at the request of United Automobile Workers officials from both the UAW International and Dodge Local 3. This wildcat walkout had idled about 38,000 Chrysler workers for a full day with aftereffects continuing through the week.

Differences at the Monroe auto parts plant of the Ford Motor Co. were also settled, sending 40,000 Ford and Lincoln-Mercury work-

### Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Apr. 18, 1953...	128,355*	28,834*
Apr. 11, 1953...	144,352	32,430
Apr. 12, 1952...	102,772	28,881
Apr. 5, 1952...	96,093	27,087
*Estimated	Source: Ward's Reports	

Charles A. Chayne, GM vice-president in charge of engineering staff, said one of the major continuing tests conducted on the desert grounds will be of air condition units for cars. He pointed out that these units are already in wide demand in that part of the country.

### Car Registrations Near 1 Million

Passenger car registrations were expected to pass the 1 million mark for the first 3 months of 1953.

R. L. Polk & Co., Detroit statistical agency, reported that an estimated 400,000 registrations in March would be added to 386,221 for January and 396,558 for February. This would result in a total of 1,182,779 against 919,715 for the first quarter a year ago.

Encouraging as this figure is, it remains well behind the record first quarter of 1951 when 1,416,162 passenger cars were sold.

Meanwhile, *Ward's Automotive Reports* says that second quarter projected schedules will reach 1,900,000 units.

ers in assembly plants back to their jobs. Here again, aftereffects would hamper some operations for another week.

Issue here was an alleged speed-up and other union demands which were settled by returning to the work schedule of last Dec. 1.

### GM Opens Desert Proving Ground

This week General Motors dedicated its new 2280-acre Desert Proving Ground near Phoenix.

In this torrid desert land, GM will carry on cooling research of engine and interiors as well as such other hot weather and dust troubles such as vapor locks.

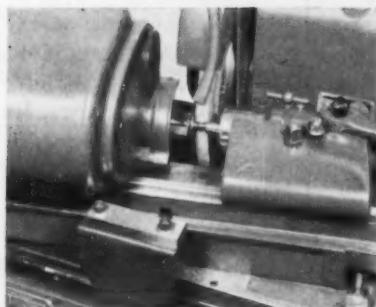
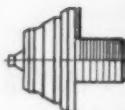
### THE BULL OF THE WOODS

By J. R. Williams



# Ideas for Production

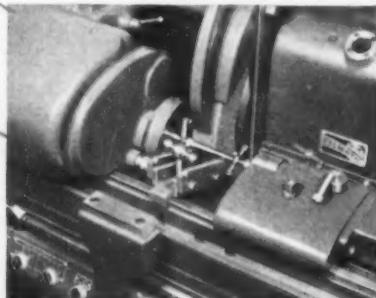
## OF SMALL PRECISION GROUND PARTS



**A short, short part...** grinding the back face and shoulder of nozzles, 83 per hour, with the aid of a special holding device. This 4" Plain Hydraulic Grinder handles other operations, too.



**Crankshafts with .050"** throw ground from the solid. Cincinnati Application Engineers toolled up a 4" Plain Hydraulic for this job with a work holding fixture featuring repetitive stopping for convenience in loading.



**Micrometer barrels**, 200 per hour, grinding diameter and bevel simultaneously. This 4" Plain Hydraulic is equipped with work cradles, hydraulic footstock, automatic infeed, and a special table type profile wheel truing attachment.

In general, the cost of machining operations on small parts should be very low. Six examples of how this goal is attained with CINCINNATI FILMATIC 4" Plain Hydraulic Grinding Machines are illustrated here. All are typical parts, with standard tooling or slight alterations on the machine to attain the highest rate of production at the lowest cost and minimum physical effort. Read how CINCINNATI FILMATIC 4" Plain Hydraulics contribute to these desirable results.

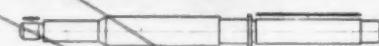
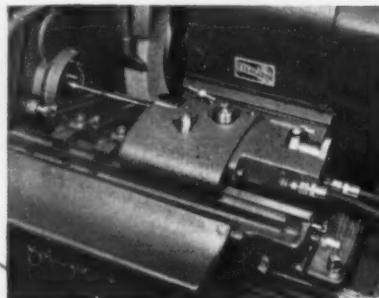
- 1) FILMATIC grinding wheel spindle bearings require no adjusting or maintenance for years.
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- 4) Automatic Infeed Attachment controls the complete grinding cycle. (Extra equipment)

You may obtain more data by writing for literature, or look in Sweet's Machine Tool Catalog for brief specifications.

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**CINCINNATI FILMATIC 4"** Plain Hydraulic Grinding Machine. Complete specifications may be obtained by writing for catalog No. G-551-2.



**Armature shafts**, grinding two diameters in two setups, 200 per hour per diameter. Labor-aiding equipment for the 4" Plain Hydraulic illustrated here consists of automatic infeed, hydraulic footstock, and work cradles.



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## This Week in Washington

### Peace Won't Cause a Business Slump

Investigation shows Korean war accounts for only 10 pct of defense expenditures . . . Budget cut would be even less . . . Will keep industry's capacity high—By G. H. Baker.

Indications are that a Korean truce will not make any appreciable difference in the outlook for high production and full employment.

Staff experts within Congress have looked into the matter, and Republican leaders are expected to base their strategy along the lines of their findings.

Legislators have been advised that Korean war expenditures account for only about 10 pct of all current military and defense spending. Using the \$47 billion Truman defense budget figure, this cut would mean a savings of only about \$4.7 billion, if applied across the board.

This figure is unrealistic, however. The actual savings would be considerably less because a Korean truce would not signal a quick withdrawal of troops.

**Save on Hot Ammo . . .** Actually, the only savings over the foreseeable future would be the money now expended for hot ammunition and replacement of weapons and equipment needed in combat.

This survey and findings support the stand taken by Senate Republican leader Robert Taft and other fiscal experts on Capitol Hill.

They still regard defense expenditures as their No. 1 target for budget trimming—but cessation of the shooting in Korea doesn't play much part in their plans.

**Won't Cut Muscles . . .** It is their aim to cut out waste not muscle and to stretch out mobilization.

Congress is getting set to resist possible pressure for any drastic cuts in necessary defense expenditures should there be a truce. This course is dictated by beliefs that:

(1) Truce overtures may be in-

tended to throw the U. S. off guard while communist forces continue to build up strength. (2) Likelihood that in any event, Russian policies will continue to be as changeable in the future as in the past.

**Build Above Need . . .** As a result, the policy will probably be to keep up high industrial capacity and to continue building new capacity somewhat in excess of current needs.

Not much is being said at present, but back of the stretchout move is the idea of using the phased-out feature of the defense program to bolster the economy whenever it begins to sag.

**Close Some Plants . . .** Assistant Defense Secretary Wilfred J. McNeil states, however, that some defense plants will have to be shut down as an economy measure.

The Pentagon official, insists that Defense Secretary Charles E. Wilson does not intend to make any

fundamental change in the nation's base for mobilization output. Instead, he says, there will be some "adjustments" in the number of factories actually turning out arms.

Mr. McNeil told a Norfolk, Va., audience last week that the planned reduction will "permit the elimination of some of the less efficient, high-cost producers whose productive capacity was temporarily required during initial buildup."

**Cut Draft Call . . .** Draft rate may be cut back even further, if Defense Secretary Wilson decides to go ahead with plans for an across-the-board trimming of Army-Navy-Air Force ranks. Last week, Mr. Wilson ordered June inductions held to 32,000 men, 21,000 below the total tagged for the draft in the previous 4 months.

Selective Service officials are stressing that the cut-back for June should not be interpreted by industry as meaning that prospects of a Korean truce have lulled the Pentagon into a sense of security.

Their explanation of the cut: The Army is entering a period of light draft calls after a year of a relatively heavy drain—more than 50,000 men per month—upon industry, agriculture, and schools. Navy and Air Force have not asked for any draftees for over a year, relying on voluntary enlistments.

**Study Guaranteed Wage . . .** Washington believes the time has come to take its first official look at guaranteed annual wage contracts. Results of a survey the U. S. Labor Dept. wants to make this summer may be the tip-off on the Eisenhower Administration's views on the need—or lack of it—for guaranteed wage provisions in future labor-management pacts.

As Secretary of Labor Martin Durkin sees it, guaranteed wage contracts are going to figure prominently in future industry bargaining sessions.

**How to Pay It . . .** One of the key issues to be settled is whether or



"Not that we take this flying saucer business seriously, of course . . ."

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## Washington News

not state unemployment insurance funds should be used to pay part of the guaranteed wages.

Various unions including the United Auto Workers think they should. The government hasn't yet taken a stand.

**Study Relationship . . .** E. L. Keenan, deputy director of the Labor Dept. Bureau of Unemployment Security, believes his agency should make a thorough study of the relationship of unemployment insurance to guaranteed wage plans. As he puts it:

"We believe we should get ourselves prepared, so in case this type of provision becomes nationwide, we and the state agencies will have a well-considered policy that will establish the proper relationship between unemployment insurance and these guaranteed wage plans so that the two will tie in together and complement each other."

Labor Dept. estimates the survey will require the full-time services of one research worker. Under present plans, the department is prepared to make the study, even if Congress votes no funds for this purpose, unless it is specifically forbidden to do so.

**Reduce Requirement . . .** Government stockpilers are thinking about reducing the currently high (99.6 pct) aluminum purity requirement. Some Office of Defense Mobilization officials believe the existing specification, P-62, is too exacting. But others point out that since the metal stockpiles are for national security, the specs must be high and of unvarying quality.

Most of the clamor for easing P-62 comes from relatively new producers, who have been having trouble getting the bugs out of their new equipment.

One proposed compromise now under discussion: Keep Spec P-62 as is, but allow a limited quantity of less pure aluminum as an official and authorized exception to the rule.

**Get More Ore . . .** Opening of a St. Lawrence seaway to ore vessels will permit shipment of as much as

40 million tons of Labrador iron ore annually to lower Great Lakes ports, the Senate learned last week.

Main issue now before Congress, as the Great Lakes-St. Lawrence Assn. sees it, is whether Congress will authorize construction of one-third of the seaway as its share of the project. Canadian government officials have said they will build the seaway—with or without U. S. assistance.

E. M. Richards, vice president, Republic Steel, told Senate Foreign Relations Committee that 20 million tons of ore per year could be brought to mills within the relatively near future. He pointed out that shipments from the Labrador deposits will not total more than 10 million tons annually by 1956. Peacetime demands alone would increase this tonnage substantially by 1960, and a war emergency could rocket annual seaway shipments to about 40,000,000 tons.

## Resources:

### Plan meeting to survey future materials needs and supplies.

Conferees representing many professions and vocations will gather in Washington late this year to discuss where the country is going in the natural resources field, and where we will be in 1975.

The Midcentury Conference on Resources of the Future will enable leaders in industry, labor,

conservation, science and education to present their ideas on subjects ranging from fuel supplies to recreational opportunities in the national forests.

### Get Ford Grant

Horace M. Albright, president of U. S. Potash Co., Inc., and head of Resources for the Future, Inc., the organization engineering the meeting, says it's the first conference of its kind since 1908. The corporation, a non-profit group with no lobbying interests, has been granted \$150,000 by Ford Foundation to stage the meeting.

In conferences being held this week to set up a prospectus for the program, one important subject that will be brought up is the speed with which the U. S. has been running through its first-line raw materials sources, as noted in the President's Materials Policy Commission report (THE IRON AGE, June 26, 1952, p. 55).

### May Need Foreign Source

Depletion of top-grade sources, is causing us to explore many secondary deposits, corporation spokesmen report.

Very nearly as serious is industry's enormous demand for water. An eightfold growth in industrial use of water between 1900 and 1950 has been noted. This week the point is being made that factories may require 200 billion gal daily by 1975, as contrasted with 80 billion now.



NEW SUB-HUNTING helicopter was recently unveiled. It's the Navy's most powerful, the Bell Aircraft XHSL-1. Performance is "beyond expectations." Special features are compactness of size and high rotor disc loadings.

# It's No Problem...

## TO FEED THIS BABY!

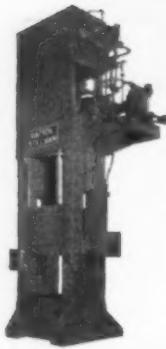


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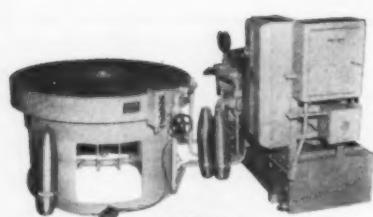
For your expanding ordnance requirements—consult Watson-Stillman first . . . experts in transforming hydraulic power into fire power.



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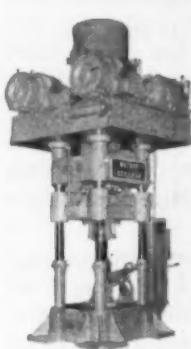
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Shell Bander



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## West Coast Report

### Western Pig Iron Market Goes Slack

**Cheaper foreign pig crowds iron market . . . New Kaiser furnace to go into blast May 15, will produce 20,000 tons a month . . . U. S. Steel cuts back furnace—By T. M. Rohan.**

Local and imported pig iron is becoming a glut on the western market and threatening to become more so in the near future.

U. S. Steel at Ironton, Utah, last week put its No. 2 blast furnace—with 800 tons per day output of merchant iron—on greatly reduced blast due to "a drop in demand for merchant iron on the Pacific Coast." About 200 workers will be laid off, but 100 will be taken on at nearby Geneva Works within 2 weeks. Maximum utilization of openhearths prevents use for more steelmaking, and stockpiles are ample.

**Foreign Pig Cheaper . . .** In Los Angeles and Seattle, Australian pig iron has been arriving in increasing quantities selling for about \$62 or \$3 under the local market price. Seattle has a special inducement in about \$1 per ton less wharfage costs.

But the major factor will be blowing in of Kaiser's third blast furnace May 15 with 438,000 tons of pig production annually. About 20,000 tons per month extra will be marketed by Kaiser with probable minor price concessions to enter the market, and a favorable freight umbrella in the major Los Angeles market against the Geneva output. Kaiser has been in the market for some years, but on a relatively small scale, ingot making getting highest priority.

**Scrap Competes . . .** The annual western market for pig is about 250,000 tons and for steelmaking is used in lesser percentage than nationally, due to availability of scrap, currently loose in the West. In merchant form, however, it makes up as high as 85 pct of the

charge for pipe and plumbing fixture manufacturers who have comparatively high specifications, and have found increased market in recent weeks.

German and Jap nails are also coming into Los Angeles in increasing quantity, the former greatly improved over pre-war types which could not be used in automatic nailing machines.

**Extrusion vs. Welding . . .** The aluminum extrusion and welding boys were getting ready for a battle of economics in the Pacific Northwest last week. Alcoa 3 weeks ago announced it was now definitely planning to install 2 extrusion presses at its Vancouver, Wash., plant. Last week Kaiser Aluminum engineers were in Cleveland, Ohio, witnessing testing of the first of two new type Yoder welding mills for production of aluminum tubing at the Kaiser Trentwood, Wash., plant.

The new mill scheduled for June installation, will form strip

into tubing and cold weld it at 450,000 cycles per second at a rate of about 60 to 180 fpm, depending on size. According to Moore Machinery Co. of San Francisco, Yoder representative for California, the new high frequency mill will be the first of its kind and is expected to reduce tubing costs for the growing Northwest market, especially with availability of low cost hydro power.

**Seidelhuber Debts . . .** It takes a pile of cold cash to build a steel mill, Seidelhuber Steel at Seattle was finding out last week. Unsecured creditors of the firm met last week in an effort to find ways of keeping the steel firm in business. Owed \$500,000 by the struggling firm, they hope to form a mortgage trust transfer to put them in line for payments directly behind the Reconstruction Finance Corp., which loaned \$750,000 in August, 1952, and other secured creditors.

Additional debts are a tax lien of \$72,000 and \$200,000 second mortgage held by Price Iron & Steel of Chicago. A \$1.4 million DPA certificate was granted the firm in July, 1952. If the \$200,000 mortgage can be paid off, creditors hope for a new RFC loan. A second block of stock may also be marketed locally, but investors would probably be cool, it's said.

**Barn Raising . . .** Last year, the firm got its mill building up partially by having workers help with construction on weekends in exchange for stock. Family style work picnics similar to old-fashioned barn raisings were held. A used 10-in. mill purchased from Heller Bros., Newark, N. J., last year has been erected and made token production but has entailed considerable costly experimentation.

A 24-in. mill has also been purchased, but is unassembled and a used 25-ton electric furnace is idle.



# ANNOUNCING 4 NEW CUTTING OILS!

## 2 DUAL-PURPOSE OILS (lubrication and cutting)

**SUNICUT 11-S** for medium duty on automatic screw machines

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All four oils keep parts and tools cooler, help maintain closer work tolerances, permit longer runs between tool dressings. All are odorless and light in color. In addition, Sunicut 11-S and 209-S have high lubricating value and are nonstaining.

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## Machine Tool High Spots

### Automation Is the Builder's Job

Toolmakers must take the initiative in supplying automation equipment, Ford execs say . . . Manufacturers must speed up replacement of old tools—By E. C. Beaudet.

What does the machine tool buyer want from the builder? In an increasingly competitive market such as the machine tool industry faces today, this question is of paramount importance. If a user does not feel that he will get what he wants from one supplier he will go to another.

Some of the answers to this question were supplied by one segment of the consumers last week. Executives of the Ford Motor Co., speaking at the Westinghouse machine tool forum in Pittsburgh and at the American Machine Tool Distributors' Assn. spring meeting in Cincinnati, discussed this subject from both technical and procurement sides.

**Builders Should Do It . . .** Both talks had a common theme: The large user of transfer machine tools, such as the automotive industry, wants the builder to assume greater responsibility in building automation into machine tools rather than leaving it to company engineers.

Almost all of the in-line transfer machine tools built have been designed for manual loading and unloading, Ford's R. Juengel told the Pittsburgh group. Conversion of this equipment from manual operation to automation is sometimes costly and time consuming.

If builders know that their machines are being purchased for an automated line, they should help the user by designing and installing automatic loading and unloading devices.

**Make Thru Units . . .** Machines, when possible, should be designed as in-line, "thru" units, he said. To design automation for the "in-and-out" type of machine is usu-

ally impractical and almost impossible as far as high production is concerned. The part should never have to unload by reversing the path through which it is loaded.

Automation could also be applied more easily, he said, if the load and unload stations were removable, or left off the machine entirely. This is particularly desirable in crowded plants, as removal of the stations would allow room for automation.

**What Should Be Done . . .** Other suggestions as to what users of transfer-type machines wanted included:

Accurate locating of machines in a line to permit automation fabrication to fit perfectly between them; adherence of overall casting and weldment dimensions to print specifications; access to the machining index stations and tooling in the body of the machine; and design of all mechanisms within an in-line operation so that they remain stationary after a stop button is pushed.

**Increase Responsibility . . .** At the Cincinnati meeting, H. Rourke, general purchasing agent of Ford

Motor Co., also urged builders to take the initiative in supplying automation equipment for machine tools.

He said that while great progress has been made already, within 5 years he expects the builder to accept the primary responsibility in this field. Mr. Rourke also stated that machine tool representatives will be expected to expand their service to the customer from the time a price is quoted until the machine is operating in the plant.

**Market Shifts . . .** With the machine tool industry working out from under a large volume of defense orders, the civilian market is once more becoming the major source of business for the industry, said Tell Berna, general manager, National Machine Tool Builders' Assn.

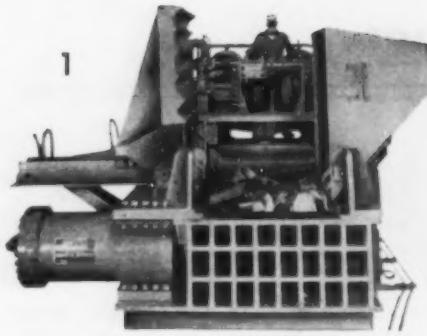
Speaking before both meetings last week, he stated that many manufacturers may not realize the potentialities that exist for increasing the nation's productivity.

**Have Old Tools . . .** Many manufacturers think they are well-equipped with machine tools bought for World War II, Mr. Berna said. However, most of these are 10 years old and a great many were designed in 1934.

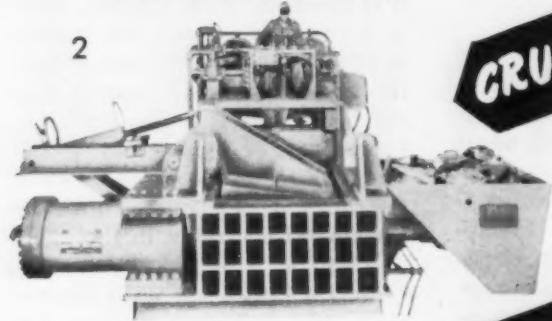
If manufacturers of civilian goods are going to meet growing competition, they must replace obsolete machine tools with new models which will lower costs and increase production.

**Replacements Lag . . .** At present he said there is a tremendous pool of obsolete equipment. To illustrate this he pointed out that there are about 2 million machine tools now in this country. If they were assumed to have a normal life of 30 years, they should be replaced at a rate of 66,000 new units per year. However, the number of new machines sold for civilian use approximates 47,000 units, including foreign sales.

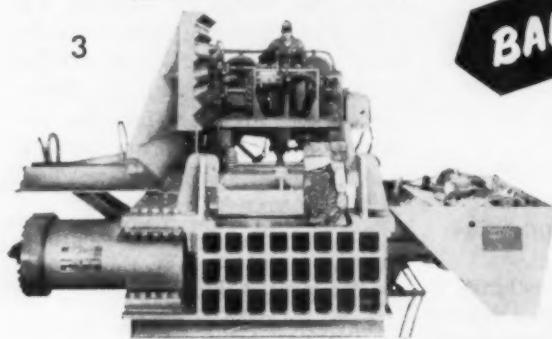




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CRUSH IT



BALE IT

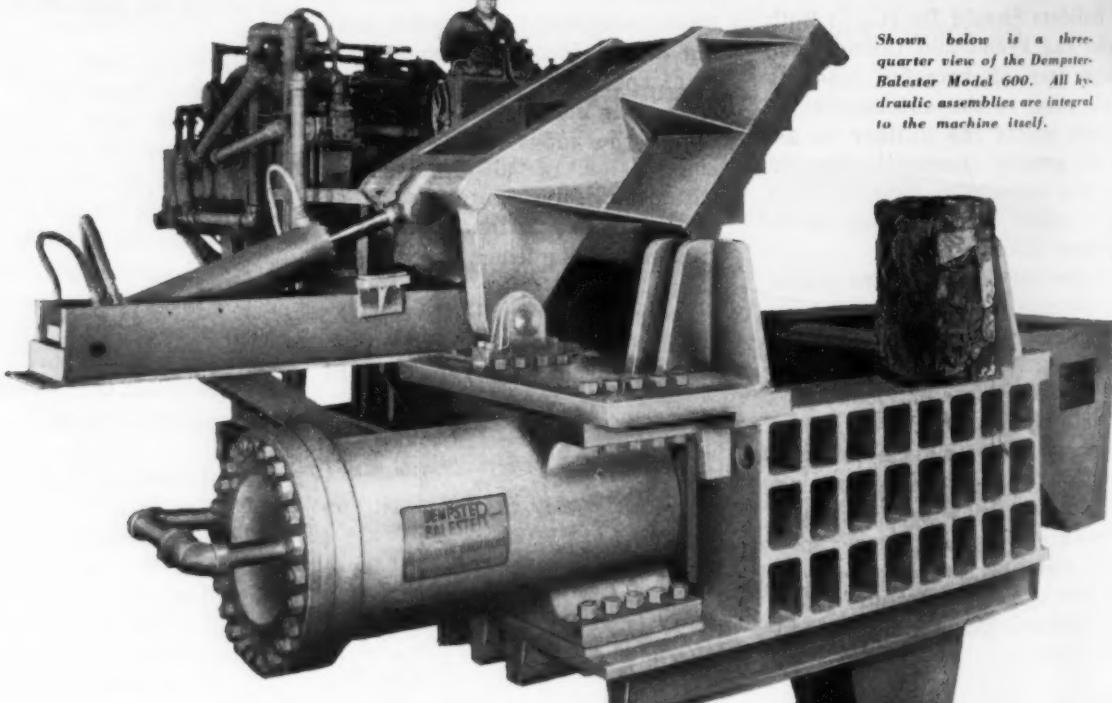
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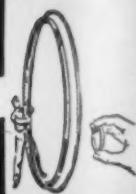


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#### Lubrication

Problem of selecting the proper high temperature lubricants has been simplified as a result of tests conducted by E. F. Houghton & Co. After making more than 150 separate tests on all types of lubricants, the company has been able to draw up a handy reference chart which makes it possible to determine the proper Houghton Hi-Temp Oil for any given temperature of 300°F. or more. The chart and other information is in a new bulletin. *E. F. Houghton & Co.*

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#### Pumps

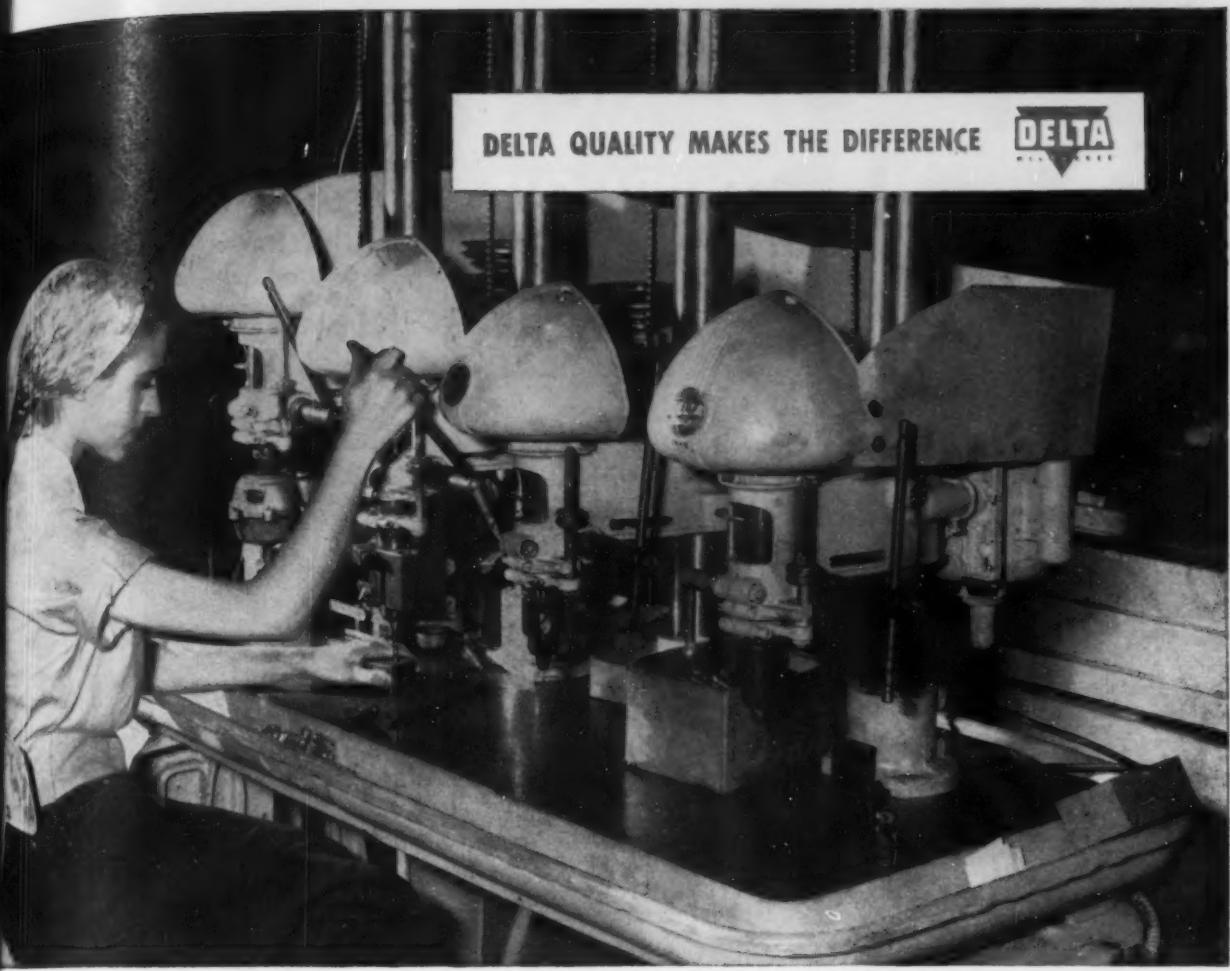
Allis-Chalmers single-stage, double-suction centrifugal pumps (Type S) are described in a newly revised bulletin. Made in 66 standard sizes, these pumps are individually engineered to customer specifications. Designed for a wide variety of industrial applications, these pumps are said to give top efficiency at low cost. *Allis-Chalmers Mfg. Co.*

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#### Sodium handling

With sodium consumption reported to be more than 200 million lb per year, Ethyl Corp.'s new brochure on the handling of sodium should find many interested readers. In addition to discussing bulk sodium and sodium sand, the booklet also covers the handling and use of dispersed sodium. *Ethyl Corp.*

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*These are some of the ways Skillman groups Delta tools:*

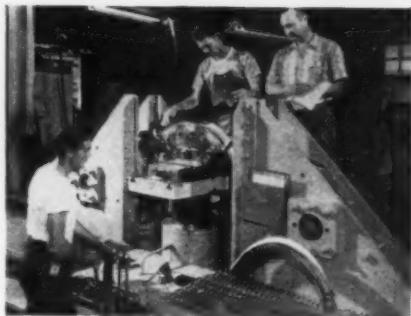
- ... two Delta drill presses side by side; one drills, the other taps.
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- ... two 17" Delta drill presses mounted on single column with opposing spindles drilling and reaming same hole in one set-up.

*Light, mobile, dependable Delta tools are easily adapted to hundreds of production jobs. There's a wealth of such performance data available to you. Ask your Delta dealer—he's in your Classified Phone Book under "Tools," "Machinery" or write for Catalog AB52 to Delta Power Tool Division, Rockwell Manufacturing Co., 640D N. Lexington Ave., Pittsburgh 8, Pa.*

**DELTA** quality power tools  
Another Product of **Rockwell**

# NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 111 or 112.

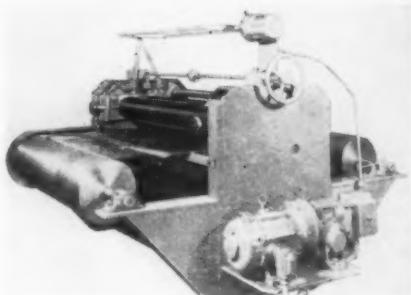


## Stretch-press forms faster, costs less

Quick and accurate forming of aluminum alloy extrusions and sheets is possible on a new high-production stretch-form press. The machine reportedly performs with consistent accuracy, stretch-leveling, pre-forming, wrapping, skin pressing, bending, forming and stretch-pressing of a variety of

parts to double curvature. Advantages are: lower cost, simpler construction and installation, greater flexibility and fewer operating personnel. The machine requires 2 min to load, form, and unload, after setup is made. *Longren Aircraft Co.*

For more data circle No. 18 on postcard, p. III.



## Spreader applies coatings to cylinder gaskets

A special automatic spreader applies protective wax coatings to both sides of cylinder gaskets simultaneously. The coating rolls are felt-covered; the doctor roll neoprene-covered. Gaskets are fed into the coating rolls by means of piano-wire conveyer which offers a

minimum of contact area. The unit is provided with safety reversing switch and explosion-proof controls. Maximum recommended coating speed is 20 fpm. Dimensional specifications are 47 in. high x 80 in. wide x 80½ in. long. *Union Tool Co.*

For more data circle No. 19 on postcard, p. III.

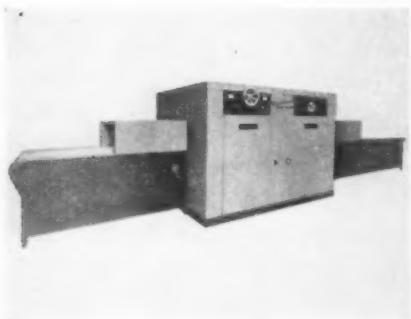


## Air height gage measures critical dimensions

Precise measurement of critical dimensions normally encountered in toolroom work are made with a new Airetest indicator. The instrument is simple, rugged, quick and easy to calibrate. Amplification is adequate and it gives positive repeat readings when approached from the front, back or either side. The indicator may be located in a place most convenient to the operator and regardless of the position

of the gaging stylus. The instrument is free from hysteresis; a movement of a few millionths is instantly indicated. It cannot stick. The Airetest consists of a pickup arm mounted on a beam actuating an air jet connected to a 1000 to 1 or 2000 to 1 amplification Precision gage, or even 5000 to 1 if necessary. A screw permits fine adjustment. *Sheffield Corp.*

For more data circle No. 20 on postcard, p. III.



## Core dryer has generator integrated with oven

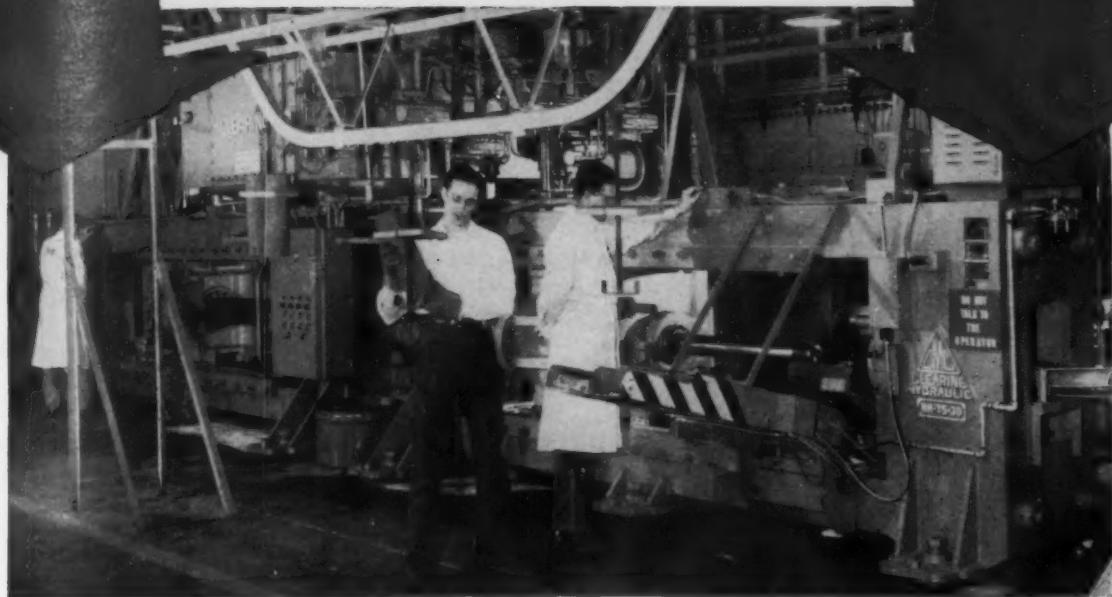
Two new Foundromatic core dryer models are 15 and 25 kw units housed in identical components. The generator section, previously a separate component, has been integrated with the oven portions to facilitate assembly and improve installation. Dimensions of the dryers, 20 ft overall x 6½ ft wide, in-

dicate a savings on floor space; allow a loading and unloading area of 9 sq ft. Easy accessibility to all electrical components, plus minimum maintenance requirements, are other features. *Allis-Chalmers Mfg. Co.*

For more data circle No. 21 on postcard, p. III.

**Turn Page**

1 press does the work of 2



## CLEARING Helps Rheem Boost Production

When Rheem Mfg. Co. took on the job of producing cartridge cases, they toolled up their New Orleans plant with a new type of Clearing hydraulic press—a press that revolutionizes cartridge case production.

The new Clearing double end press produces at both ends of the stroke—does the work of two conventional presses. While one slide has completed a draw and is on its return stroke, the other slide is performing a drawing operation on the opposite end of the press.

Clearing horizontal double end presses represent savings not only in capital investment, but they require less manufacturing space and less maintenance than two conventional presses. Double end presses also reduce original installation cost, productive labor cost, and power consumption—since only one hydraulic drive unit is used.

The double end press was Clearing's answer to the problem of cartridge case manufacture. Supplying the right answers to manufacturers who make all types and sizes of products has been a strong point with Clearing engineers for years. If you have a problem involving power presses, you'll find the best answer at Clearing.

**CLEARING MACHINE CORPORATION**

6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS

HAMILTON DIVISION—HAMILTON, OHIO

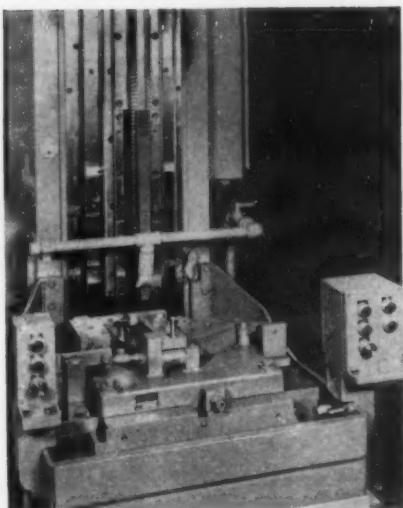
**CLEARING PRESSSES**

THE WAY TO EFFICIENT MASS PRODUCTION



## New Equipment

Continued



### Aircraft engine spider broached on single ram

A combination manual and automatic control setup permits broaching aircraft engine spiders with complete support for the part being broached, on standard single ram broaching machines. The machine is a Colonial 6-ton, 54-in. stroke single ram, used to broach six identical contours on the six arms of the aircraft spider. In operation, the part is placed in the fixture and clamped in place manually, locating from the splined hole. Each cutting stroke broaches contours between one set of arms on

the spider. When the circuit is actuated to start the broaching cycle, support jacks in the fixture automatically support the two arms opposite the surfaces being broached. Then when the cut is completed, the fixture automatically shuttles clear of the broach and the jacks are released. The operator then manually unclamps the part and indexes it in the fixture to the next position for broaching the adjoining set of contours. Colonial Broach Co.

For more data circle No. 22 on postcard, p. III.

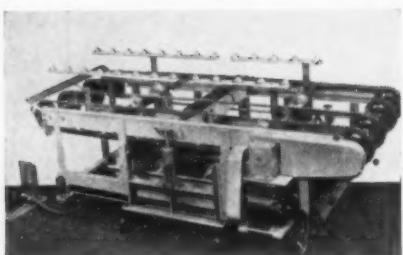


### Light generator facilitates optical flat checks

Large monochromatic light generator meets industrial needs for greater capacity so that large parts or large numbers of smaller parts can be checked more easily and rapidly for surface flatness, finish, dimension, etc. The Monolight facilitates the use of large optical flats, up to 10 in. diam. Work height capacity of 24 in. permits inspection of parts of considerable thickness. Sizable quantities of parts may be checked on the large

30x30-in. work table which is completely blanketed by monochromatic light of 20-ft candles intensity as measured on the working surface. Groups of parts to be checked with optical flats can be allowed to normalize right at the light source. The light source or head of the instrument swings in a 160° arc from side to side. Light generating element in the Monolight is mercury vapor. DoAll Co.

For more data circle No. 23 on postcard, p. III.



### Conveyor handles long narrow strips cut by shear

Called the Fried Coilveyor, a new sheet and strip handling machine can support narrow strips up to 6 ft long x 20 to 48 in. wide as they are cut by the shear. After the ribbon comes off the coil it passes through the leveler and is then cut by the

shear. The cut ribbon is lowered to the Coilveyor's conveyor belts, and carried away. Plungers automatically return to support the next cut. Fried Steel Equipment Mfg. Corp.

For more data circle No. 24 on postcard, p. III.



### Roller coating wire fences saves time, money

Economy in wire fence maintenance is said to be effected by applying Rust-Oleum finish coating with a roller. Ninety-nine per cent of the material is used on the fence rather than on the workmen and the ground; 70 pct of the other side of the fence is coated at the same time. A special, long-nap, lambs-wool roller is dipped into the container of material (usually 5-gal containers are best) and is pulled up on a flat board surface

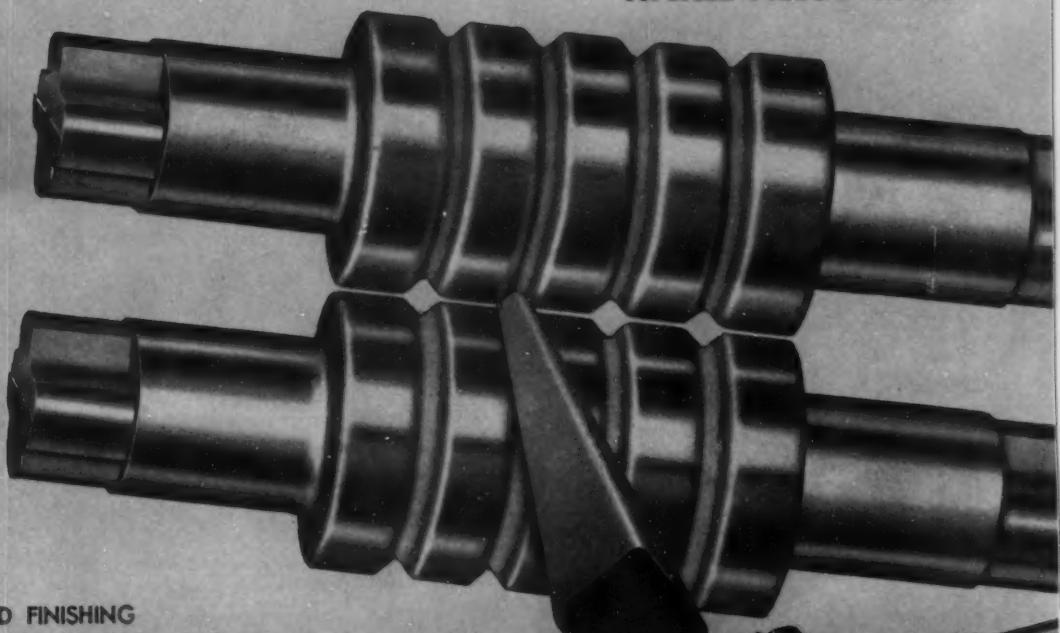
to remove running surplus material. The roller is then applied to the area to be coated. Even barbed wire on top of the fence can be rolled on. Cleanliness of the method of application is evidenced by no splashing, drippings or spray. The job can be accomplished in half the time required when using brush or spray methods. Rust-Oleum Corp.

For more data circle No. 25 on postcard, p. III.

Turn Page

\***PITTSBURGH GRADE "25" ROLLS** are color  
marked for specific uses in rolling...

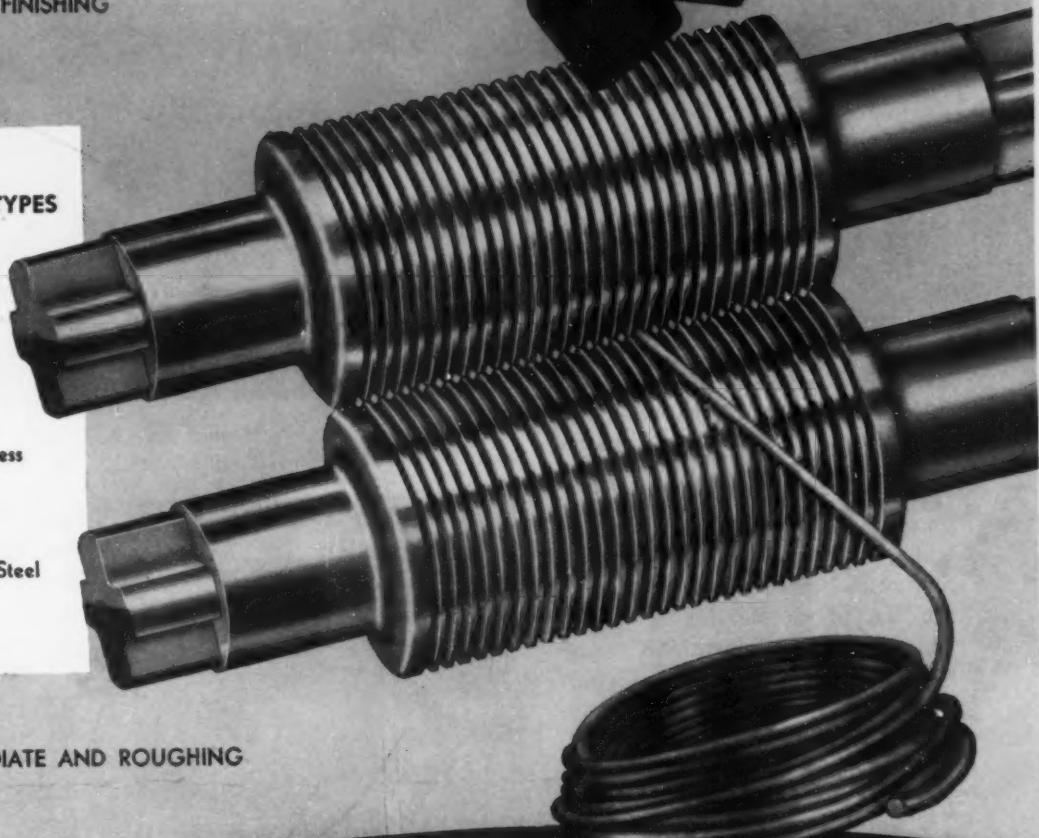
\*NICKEL ALLOY IRON



BILLES — INTERMEDIATE AND FINISHING

OTHER PITTSBURGH ROLL TYPES

Chill  
Moly Chill  
Special Rail Finishing  
Phoenix "K"  
Pittsburgh Grade 35  
Pittsburgh Grade 45  
Pittsburgh Grade 55  
Pittsburgh Grade Special Process  
Phoenixloy  
Phoenix Metal  
Phoenix Metal Master  
Phoenix "A" Alloy Steel  
Phoenix "A" Special Alloy Steel  
Carbon Steel



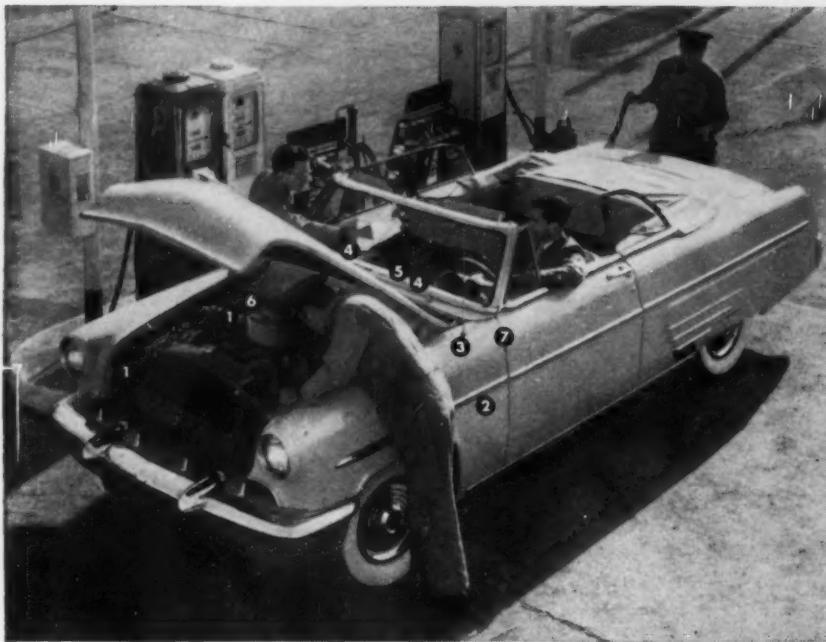
RODS — INTERMEDIATE AND ROUGHING



**PITTSBURGH ROLLS**

ROLLS DIVISION of BLAW-KNOX COMPANY • PITTSBURGH, PA.

## METALS



WE EXPECT the motor to roar when we push the starter, the wipers to swish away rain, the heater to pour out warmth. Berylco parts make this possible. For parts and key numbers, see below.

### STRENGTH PLUS CONDUCTIVITY Beryllium copper supplies the automotive industry with reliable low-cost answers

The element beryllium was an 18th century discovery which didn't amount to a tinker's dam until it was alloyed with copper in the 1930s. The result: miraculous. The new alloy retained the good conductivity and corrosion resistance of copper, with the strength and hardness of many steels.

Alert car manufacturers, always on the lookout for reliable materials which will give long life and eliminate costly breakdowns, were among the first to use Berylco beryllium copper. It now appears in many small—but essential—parts of your car. Engineers know these parts will function perfectly for millions of cycles without relaxation or loss of strength or conductivity.

The outlook for expanded use of beryllium copper is extremely favorable. Increased supplies of beryl ore and domestic mining activities will undoubtedly mean (1) the development of new alloys and (2) a substantial addition to the thousands of applications now in use. Manufacturers who would like to take

advantage of this versatile alloy are invited to share the experience and know-how of the world's largest producer. For information, write THE BERYLLIUM CORPORATION, Dept. 3D, Reading 6, Pa.

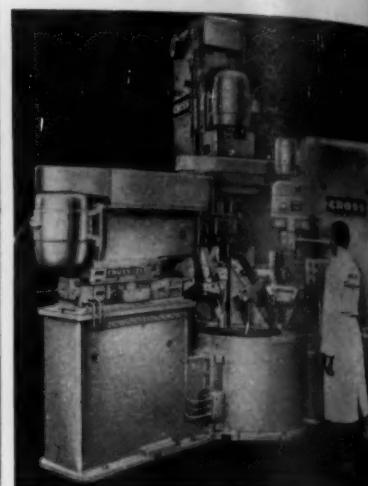
*Tomorrow's products are planned today—with Berylco beryllium copper*



Shown here are the Berylco parts numbered in the 1953 car above—a few of the many which help deliver top performance. Reading across, they are (1) wire clips; (2) dimmer switch terminals; (3) antenna raiser; (4) windshield wiper springs; (5) cigar lighter contact; (6) heater control; (7) door switch spring.

## New Equipment

Continued



### Special machine

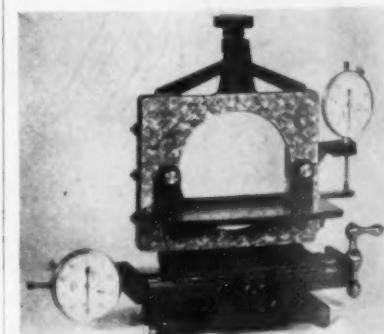
Milling, boring, drilling, chamfering and tapping the exhaust manifold tail pipe pad for six-cylinder engines can be performed on a special machine at the rate of 120 pieces per hr at 100 pct efficiency. Parts are held on a fluid, motor-driven index table with six stations—one for loading and unloading and one each for milling, boring, drilling, chamfering and tapping. Hydraulic and electrical construction of the machine is to JIC standards. *Cross Co.*

For more data circle No. 26 on postcard, p. III.

### Measuring stage

A coordinate measuring stage for use on bench optical projectors will give 1 in. longitudinal travel, 1 in. vertical travel and 1 in. focusing travel. With addition of two 1-in. travel dial indicators measurements in coordinates can be made. An adjustable right angle platform can be positioned in three different horizontal planes. *Portman Instrument Co., Inc.*

For more data circle No. 27 on postcard, p. III.



Turn Page

*Just as a goalie needs protection...*



## IRON and STEEL *Need* PROTECTION

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

### HANLON-GREGORY GALVANIZING COMPANY

IN THE HEART  
OF THE STEEL INDUSTRY

Pittsburgh, Pennsylvania

The World's largest Job Galvanizing Plant

A. J. DIEBOLD, President

galvanizing . . . pickling . . . painting . . . oiling



## New Equipment

Continued

### Angle grinder

Advance design of an air-powered, direct drive angle grinder eliminates need of bevel gears, or gears of any kind. It has enough power to provide fast, safe, and efficient operation on practically all surface grinding, cut-off and sanding jobs. Speed, at 90 psi air pressure, is 6000 rpm. Two types of dead handles are available: one straight, the other 30° off of straight. Handles may be attached to either side of grinder, and the angle dead handle may be rotated to any one of four positions. *Ingersoll-Rand Co.* For more data circle No. 28 on postcard, p. III.



## TODAY'S GREATEST CRANE VALUE... Series "D" *Load Lifter* Cranes

**ADVANTAGES** of the most expensive cranes are engineered into the new Series "D" 'Load Lifter' Overhead Electric Traveling Cranes built by Shaw-Box. They are priced far lower than other makes designed for average industrial service, because Shaw-Box employs standardization and mass production techniques to the fullest extent.

**SERIES "D" "LOAD LIFTER" CRANES** are ruggedly built in three basic types and three styles of trolleys. Capacities range from 1 to 20 tons. Three-girder bridge construction assures freedom from whipping and skewing. All gearing operates in oil in sealed housings. For maximum efficiency, every bearing is a ball or roller bearing. The bridge and trolley wheels are carried on axles that rotate on anti-friction bearings. On floor-controlled cranes a pendant-type push-button assembly is provided to actuate variable speed magnetic controllers. Cage-controlled cranes are operated by master switches. You can be certain of accurate, easy control, complete safety, low maintenance, economical operation and dependable service.

**SELECTION IS EASY** because every Series "D" 'Load Lifter' Crane is cataloged by size and type. Write for Catalog 221 and choose the crane that meets your requirements exactly.

# *Load Lifter*® CRANES



MANNING, MAXWELL & MOORE, INC. Muskegon, Michigan  
Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' Industrial Instruments, and Aircraft Products.

### Improved power bender

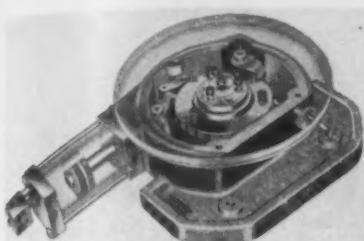
Di-Acro hydraulically operated bending machines have been redesigned to distribute more evenly the stress and strain developed during bending and also to keep mechanical distortion to a minimum. The bending table changed from fabricated steel to a strongly-ribbed alloy casting provides greater strength during bending.



and allows the integration of the gear housing into the casting assuring positive alignment at all times. Foot controls have been added and a 3 hp motor replaces the 2 hp motor. Improved rigidity is provided also by  $\frac{1}{4}$  to  $\frac{1}{2}$  in. steel plate on the cabinet. The power bender forms simple and complex bends, operates in clockwise or counter clockwise direction. *O'Neil-Irwin Mfg. Co.* For more data circle No. 29 on postcard, p. III.

### Dial feed tables

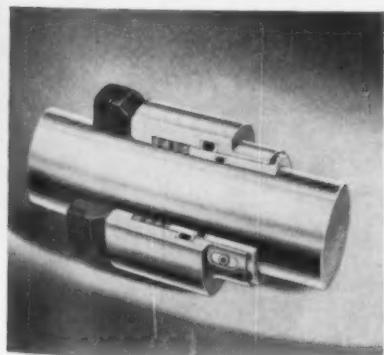
With positive-lock feature, new dial feed tables have a top plate that cannot over-ride and lose index under the severe conditions of operation. This is achieved by the use of an auxiliary air cylinder built inside the table whose func-



tion is to bring into a toggling position, a set of mechanical members which lock the feed pawl to the ratchet in a positive fashion. An anti-back-up pawl locks the table against rearward rotary motion. Two models are available, in the standard 4-6-8-12 and 24 set of indexing positions. *A. K. Allen Co.*. For more data circle No. 30 on postcard, p. 111.

### O ring seals

Simplicity of design features a new O ring mechanical seal for rotating pump shafts. The small number of parts affords easy manufacturing adaptability of the improved seal to withstand any liquid, whether mild, harmfully corrosive or extremely hazardous, on rotating pump shafts. They are fur-



nished in Type O, an unbalanced seal for pressures up to 200 psi, and Type OB, a balanced seal for pressures up to and over 1000 psi. Both can be supplied with single spring or multiple spring, and in pin-drive or sleeve-drive construction. *Garlock Packing Co.*

For more data circle No. 31 on postcard, p. 111.  
*Turn Page*

# use castings?



## WELDMENTS CAN SAVE YOU MONEY!

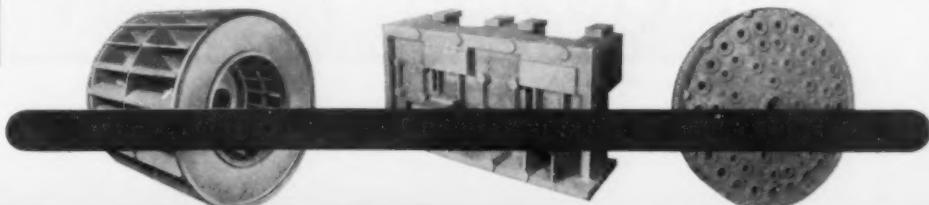
Acme weldments are replacing castings for leading machinery and equipment manufacturers everywhere because they do a better job at lower cost. Experienced Acme engineers at work with Acme's complete fabrication facilities can give you these same advantages . . . Acme's new 24-page, illustrated booklet shows you why. *The Facts about Weldments and Castings* tells you what you should know about their relative strength, rigidity, vibration, design flexibility, and cost . . . facts to help you specify and save. And it's yours for the asking . .

**—A-C-M-E—**  
**TANK and WELDING**  
DIVISION of THE UNITED TOOL & DIE CO.  
1078 New Britain Ave. • West Hartford 10, Conn.

- A.S.M.E. Qualified Welders
- National Board Approved
- Hartford Steam Boiler Inspection Service
- A.P.I. Approved
- Underwriters Label and Inspection Service
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*Write for yours TODAY!*



**IN YOUR STEEL FABRICATION  
FASTEN IT BETTER...AT LESS COST, WITH NELWELD**

**ARC WELDS STUDS TO STEEL IN A SPLIT-SECOND**

**AN ELECTRIC ARC WELDING PROCESS**

### THE NELSON FASTENING ENGINEER WILL SHOW YOU



Production men can actually participate and test the results on your own products.

For full information on Nelweld as applied to steel fabrication, write the Main Office, Lorain, Ohio.

*Fasten it Better...at Less Cost, with*

**NELSON STUD WELDING**

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T M REG

### New Equipment

Continued



### Safety device

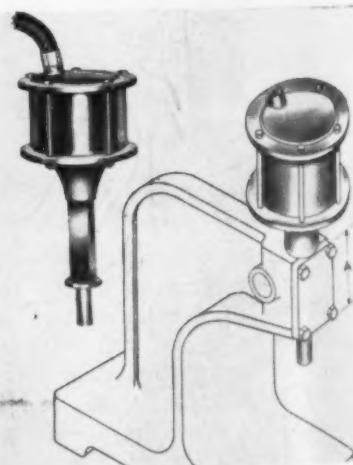
Silent Sentry is an automatic full-to-empty bracket indicator with a built-in scale which gives a constant recording of the 2½ to 20-lb charge condition of the CO<sub>2</sub> fire extinguisher. It is a sturdy device, easily calibrated with a screw driver. The collar clamps around the neck of the extinguisher, attaches to any wall, and is sealed to prevent tampering. *National Equipment Distributors Co.*

For more data circle No. 32 on postcard, p. III.

### Air conversion unit

Any hand-operated arbor press can become an air press in about 5 min. This is done by removing its present ram and replacing it with a Paragon air conversion unit designed for that special make and model hand press. Ease of interchangeability permits the user the advantages and flexibility of having both an air press and a hand press. All tools and fixtures which were made to fit the bed of the hand press can be used with the air unit without any changes necessary. *Price Machine Products.*

For more data circle No. 33 on postcard, p. III.



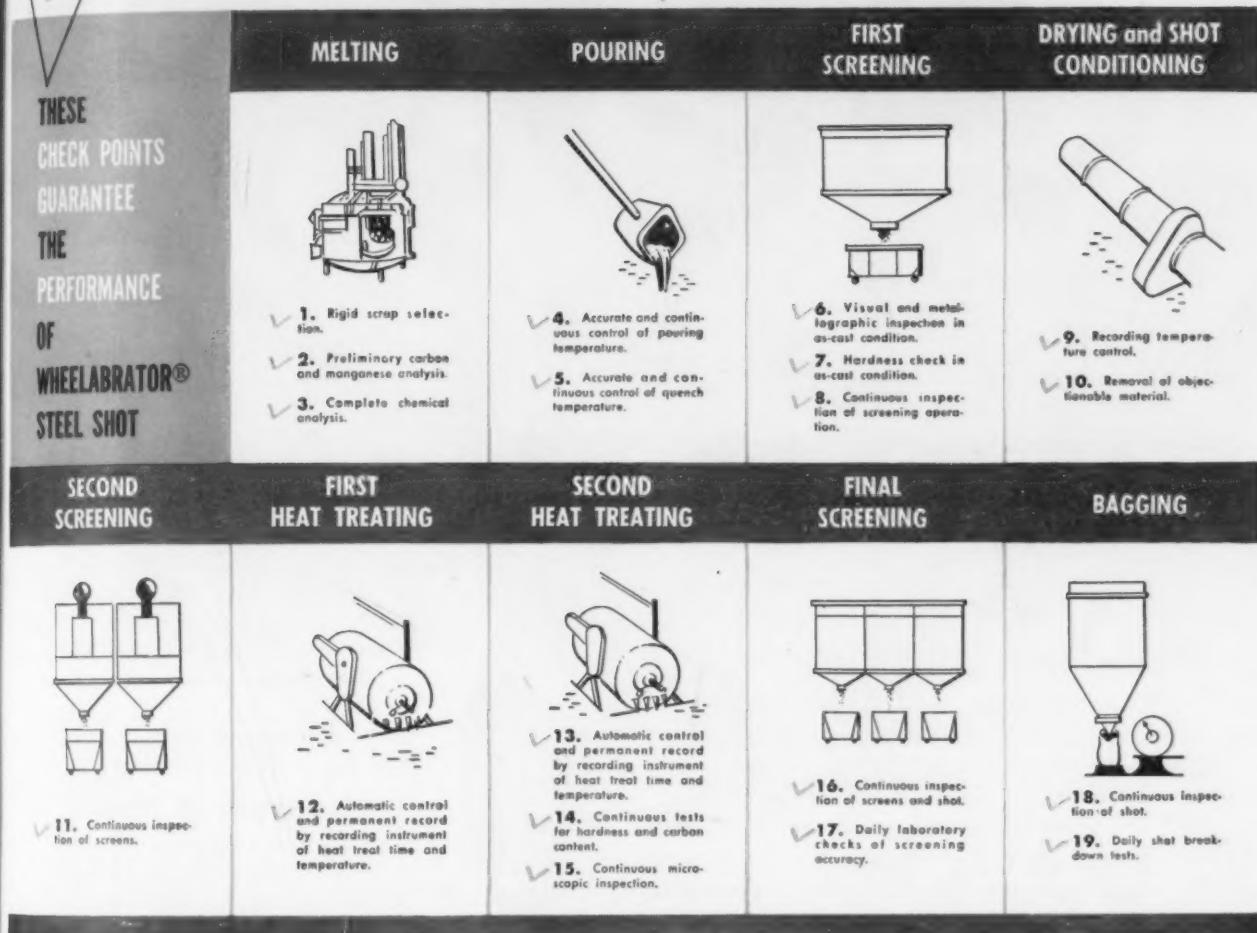
Turn Page

# **CONTROL is the key**

**to the unequalled performance of**

## **WHEELABRATOR® STEEL SHOT**

These  
check points  
guarantee  
the  
performance  
of  
WHEELABRATOR®  
STEEL SHOT



How many perfect castings do you make in a hundred million pieces? One average shipment of shot, either iron or steel, contains that many individual castings. The greater percentage of imperfect castings it contains, the faster it breaks down and requires replacement. Even slight variations in structure or hardness can have a tremendous effect on cleaning costs.

After years of research, Wheelabrator has developed and patented a method for producing shot with an absolute minimum of defective pellets. It took a new plant and new production methods in order to achieve this

quality and there are 19 CONTROL CHECKS to see that it is maintained.

This new "Wheelabrator" Steel Shot is made of the finest electric furnace steel which is heat treated to a tempered Martensite microstructure, the hardest and toughest of the iron carbon alloys. It is given a double heat treatment at automatically controlled temperatures to provide a new standard of toughness, solidity, uniformity and efficiency.

*FOR YOU this means less abrasive to buy, fewer machine parts to replace, less maintenance labor required and lower freight costs.*



Bulletin 89 tells the complete story about "Wheelabrator" Steel Shot and what it means to the user in terms of performance and economy. Write for your copy today.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

**American**  
WHEELABRATOR & EQUIPMENT CORP.

510 S. Bykit St., Mishawaka, Indiana

## New Equipment

Continued



### COLD ROLLED STRIP *made-to-measure for your products*

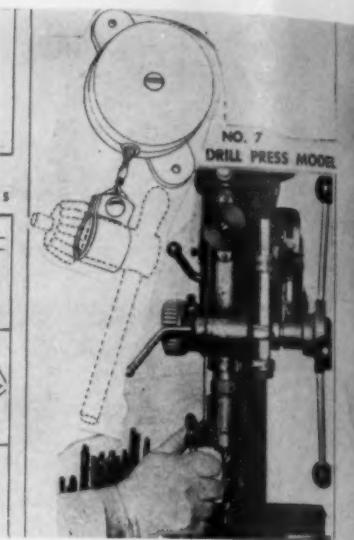
BY FOLLANSBEE

Follansbee Cold Rolled Strip is custom-made strip steel that fulfills most manufacturing needs. Regardless of the stamping or forming operations involved, the quality of Follansbee Cold Rolled Strip offers these real advantages:

- Close tolerances
- Mill finishes for quality products
- Supplied in coils for fast action in presses

You get real production engineering efficiency and time-saving economy when you feed your presses directly from coils of Follansbee Cold Rolled Strip.

Follansbee Steel Corporation is set up to provide you with quick, direct, personalized service. Consult your trained Follansbee Steel representative. He will be glad to discuss your fabricating problems with you.



### Chuck key holder

A drill press chuck key will never be lost or misplaced if mounted on the press column in a Key-Bak, a holder which automatically retrieves the key. It is a watch size, precision made, heavily chromed case, steel chain that recoils into the case. Swivel connection prevents the chain twisting. Various models of Key-Bak are useful for other applications. *Lummins Mfg. Co.*

For more data circle No. 34 on postcard, p. III.

### Waterproof tape

An economy pressure sensitive tape, known as Permaceal 691, is for industrial and defense use, conforming to government specification Jan-P-127, Type I, Grade B. It is used primarily for waterproof sealing of cartons and equipment, and will serve as a companion tape to Permaceal 68. *Industrial Tape Corp.*

For more data circle No. 35 on postcard, p. III.

### Soldering test kit

Test quantities of fluxes, thinners, residue removers, and chemical wire strippers have been doubled in the new Divco soldering flux test kit. Number of items has been increased to 24 of the most representative, and soldering flux chart No. 52 describes each flux and its applications. *Division Lead Co.*

For more data circle No. 36 on postcard, p. III.  
*Turn Page*

### FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP

SEAMLESS TERNE ROLL ROOFING

POLISHED BLUE SHEETS AND COILS

Sales Offices—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle; Toronto and Montreal, Canada.  
Mills—Follansbee, W.Va.

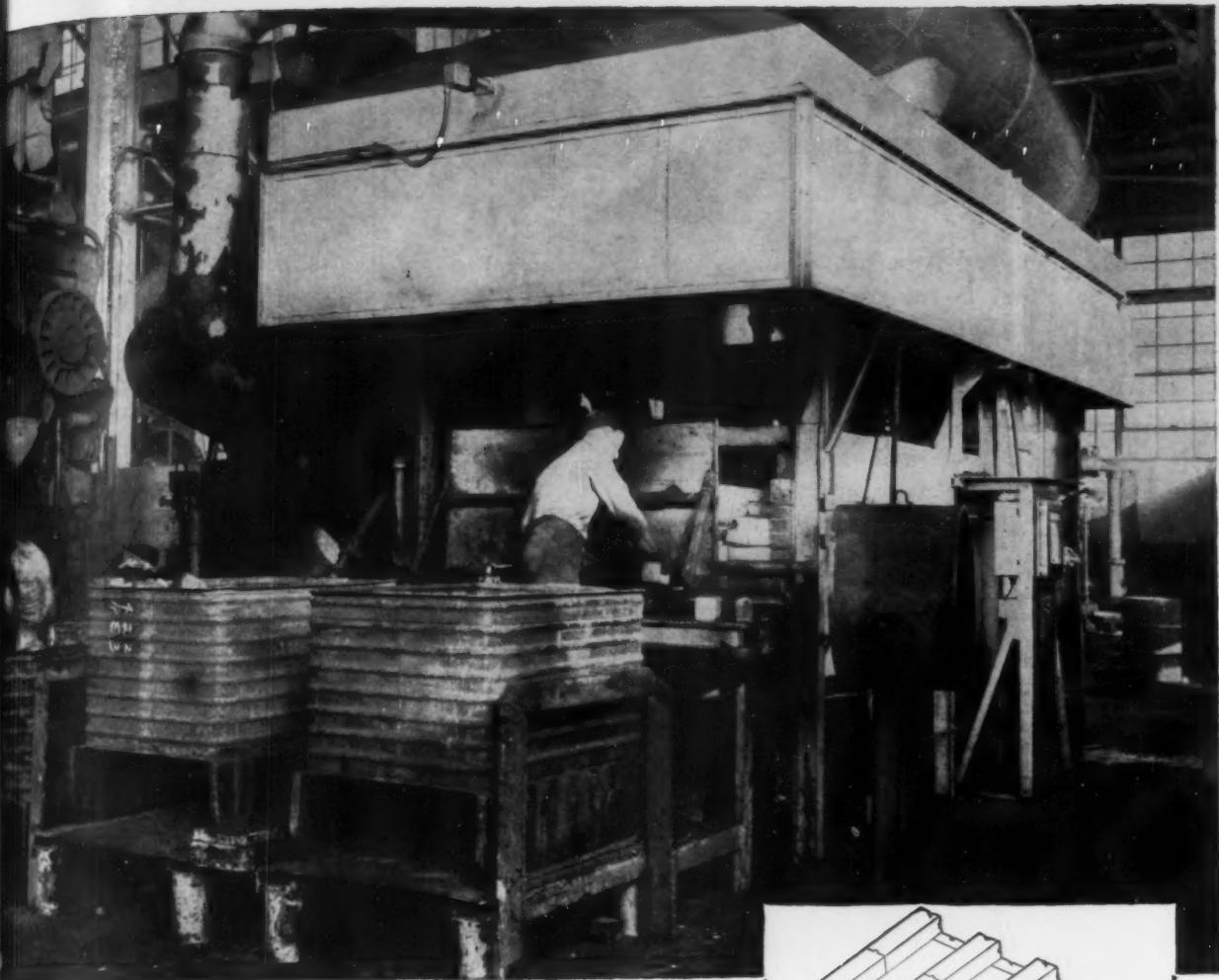


FOLLANSBEE METAL WAREHOUSES

Pittsburgh, Pa.

Rochester, N.Y.

Fairfield, Conn.



## Silicon carbide outlasts chrome hearth 3 to 1

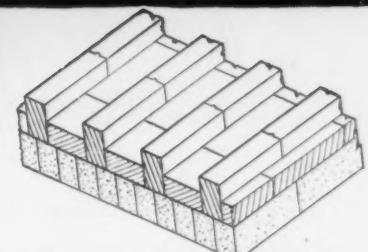
This is a pusher-type forge furnace, one of four operated by an automotive company. Steel slugs 4" x 4" x 5", weighing 16 lbs., are heated to 2250 F, and every hour, roughly 250 are pushed through.

The rammed, chrome-ore hearths they formerly used, wore out rapidly under this abrasion and heat. At most, they lasted three months. Interim repairs were often needed, too, mostly on the hot end.

Then, they put in a channel-type hearth (see drawing) made of one of the hardest, most abrasion-resistant materials in existence — CARBOFRAX® sili-

con carbide refractory. As a result, they now get an average of nine months life, and need few or no repairs.

Now that their hearths last three times longer, their labor, material, and down-time costs have naturally been reduced proportionately — sizeable savings, all. And all savings that other companies have duplicated. Interested? It costs nothing to check up. Simply address: Department B-43, Refractories Division, The Carborundum Company, Perth Amboy, New Jersey.



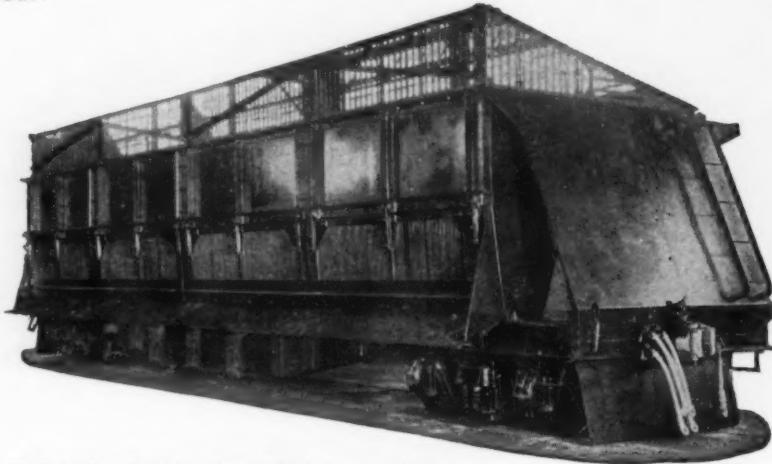
Here's how the CARBOFRAX hearth is constructed. The skid rails act as guides, making in effect, a hearth with several separate channels.

# CARBORUNDUM

Registered Trade Mark

# 50 Years of KNOW-HOW

For more than 50 years Atlas has been designing coke oven machinery of acknowledged excellence. Coke Charging Cars, Coke Quenching Cars, Door Extractors and Coke Guides must be built with "know-how" to produce best operating results and lowest maintenance. Let Atlas quote on your needs.



**COKE QUENCHING CAR**

The latest Atlas Quenching Cars have longer life with lower maintenance than previous types. Their cost also is lower. This is due to the welded "corrosion-resisting" frame of heavier material with fewer joints and all joints weld-sealed together with the use of abrasion resisting floor plates, which outwear cast plates and cost much less to replace. There is no welding on Atlas abrasion resisting floor plates. The improved door operating mechanism is sealed against the entrance of coke dust and water and is simplified to eliminate the troublesome line shafts. Coke deflectors are provided at each end. Air hoses are armor-clad. Gates generally are of steel bars arranged for easy replacement. Cars are supplied with or without upper coke racks.

**Custom Builders of Coke Oven Equipment**



**THE ATLAS CAR & MFG. CO.**

ENGINEERS

1140 IVANHOE RD.

MANUFACTURERS

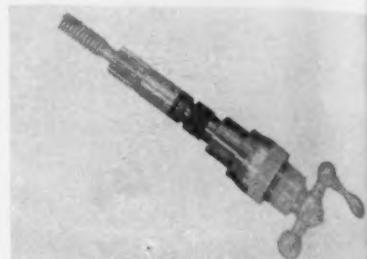
CLEVELAND 10, OHIO, U. S. A.

## —New Equipment—

*Continued*

### High tolerances

High tolerance precision parts can be produced on inexpensive equipment with the use of a new lathe attachment, Microturn. It allows unskilled labor to accurately adjust to, and hold tenths of thousandths on popular priced machines; is said to give ten times the adjustment accuracy the normal lathe dial affords. Microturn uses an 80 pitch thread completely



encased in thrust and needle bearings. For one complete revolution of the thread the tool position advances 0.0125 in. forward. Microturn in no way affects the normal operation of the lathe. Power cross feed is similarly not affected by installation of the attachment. Leon G. Arpin Co.

For more data circle No. 37 on postcard, p. III.

### All-welded wheel

A new series of all-welded, pressed steel wheels are manufactured in four sizes, 6, 8, 10 and 12 in. and available with either ball or oilite sleeve bearings. Choice of semi-pneumatic or solid rubber tires is optional. Goddeyne Wheel Products. For more data circle No. 38 on postcard, p. III.

### Wrinkle finishes

Color stability of wrinkle finishes in pale shades and pastel colors is claimed for a new line of Rinkeloid wrinkle finishes. Because of this color stability and pattern control during baking, normal variations in oven temperature will not result in variation in Rinkeloid color. Blacks, grays, and browns will tolerate as much as 25° differences in oven temperature without the usual widely varying color tones, and pale cream, blue, green, ivory, and pink are said to be produced easily. Standard-Toch Chemicals, Inc.

For more data circle No. 39 on postcard, p. III.

# The Iron Age

## SALUTES

Harlow H. Curtice

This one-time bookkeeper climbed to one of industry's top jobs by always "doing it the hard way."



**Y**ES, it is the great American success story. A 20-year-old boy from a small town answered a blind newspaper ad for a bookkeeper at AC Spark Plug Co. At 59 he holds down the No. 1 job in one of the world's greatest industries—president of General Motors.

Don't ask "Red" Curtice for any magic formulas for success. He doesn't believe in them. He summed up his personal philosophy in typically concise fashion for the graduating class at Olivet College a few years ago:

"Do it the hard way! Think ahead of your job. Then nothing in the world can keep the job ahead from reaching out for you . . . Be bold, knowing that no one can cheat you but yourself."

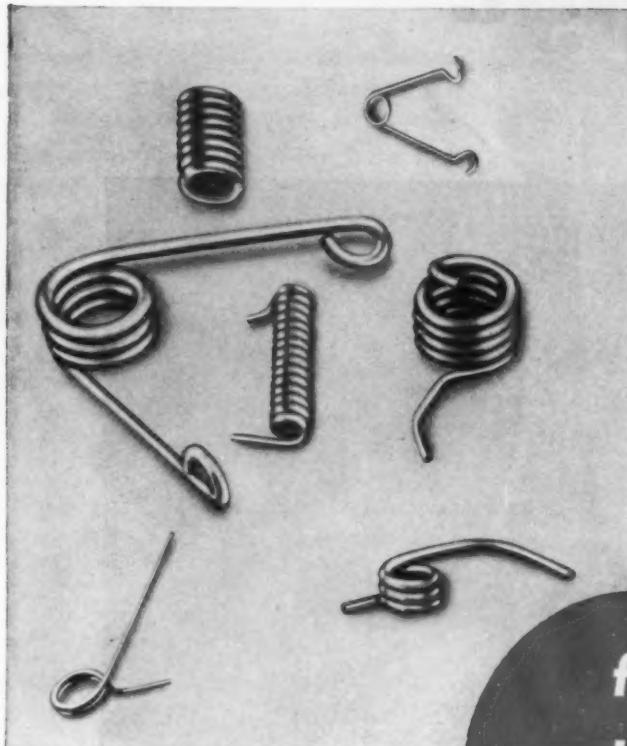
Red is a hard worker—8 to 6 daily—and he's never stopped learning. Originally trained in accounting and finance, he has a sure feel for engineering, styling and production. And he's one of Detroit's greatest boosters for selling.

An associate sums him up: "Harlow Curtice can pitch, catch and cover first base at the same time."

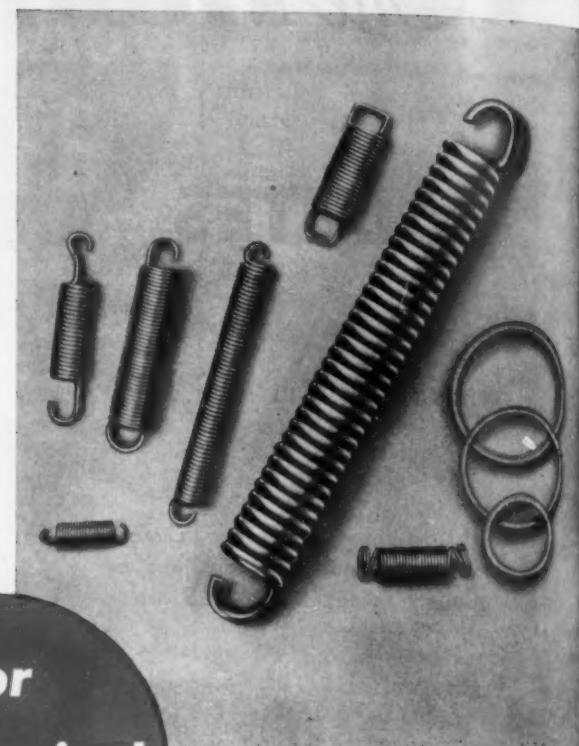
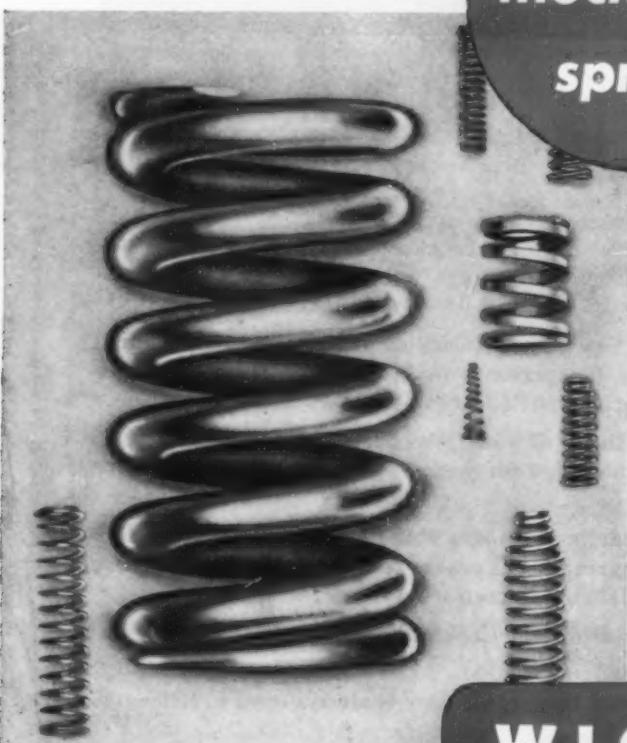
Easy going, with an alert sense of humor, his door is always open to colleagues for discussion and advice. When he can get away from his desk, he's likely to take off on a hunting and fishing trip. And he's a faithful fan of baseball and football.

Married in 1927, he has three daughters, who keep him busy at his Flint, Mich., home.

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Chicago • Detroit • New York • Philadelphia

**WICKWIRE WIRE**

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION  
THE COLORADO FUEL AND IRON CORPORATION



# The Iron Age

## INTRODUCES

Kenneth M. Leghorn, elected president, SUN TUBE CORP., Hillside, N. J. He succeeds R. Smith Schenk, who is retiring.

Tom McMichael, and Frank Stevenson, appointed special assistants to the president, THE COOPER-BESS-EMER CORP., Mount Vernon, Ohio; Willard Luli, named works manager, Grove City; and Hugh Stevenson, becomes assistant works manager.

N. George Belury, elected a vice-president, AMERICAN BRAKE SHOE CO., New York.

R. W. Stetson, appointed vice-president, STUART STEEL PROTECTION CORP., Kenilworth, N. J.

W. S. Simpson, elected vice-president in charge of the Raybestos Div., RAYBESTOS - MANHATTAN, INC.; and M. A. Thompson, appointed assistant comptroller.

Harry N. Bailey, appointed vice-president, Rosan Thread Div., ROSAN ENGINEERING CO., Newport Beach, Calif.

William M. Warner, elected vice-president, BROWN-MCLAREN MFG. CO., Hamburg, Mich.

Oliver T. Burnham, secretary, elected vice-president, LAKE CARRIERS' ASSN., Cleveland.

Carl A. Peterman, made director of purchases, BLISS & LAUGHLIN, INC., Harvey, Ill.; and John Bossert, becomes purchasing agent.

Ralph F. Merriam, named director of purchases, TINNERMAN PRODUCTS, INC., Cleveland; and Edward W. Wehrle, named purchasing agent.

John R. McVeigh, appointed chief engineer and engineering executive, Armed Services Research & Development Projects, ALLOY ENGINEERING & CASTING CO., Champaign, Ill.

John M. Stevenson, becomes chief engineer, Oil Field Equipt. Div., UNITED MACHINE CO., Fort Worth, Texas.

Elmer J. Keller, appointed superintendent, Indiana Harbor plant, pipe mills, THE YOUNGSTOWN SHEET & TUBE CO., Youngstown, Ohio.

R. C. Smith, named field engineer, Rochester, N. Y., THE BELLOWS CO.; Aaron I. Kutz, New York field engineer; and Robert E. McClure, field engineer, Boston.

Allen Parkington, appointed chief draftsman ELECTRIC REGULATOR CORP., Norwalk, Conn.

Joseph L. Walker, becomes contracting engineer, HEYL & PATTERSON, INC., Pittsburgh.

Lou Doelling, promoted to field engineer, LAMSON CORP., Syracuse, New York.

Paul Feeger, joins Albuquerque industrial sales engineering staff, MINNEAPOLIS - HONEYWELL REGULATOR CORP.

John J. Holloway, becomes supervisor, traffic department, KAISER STEEL CORP., Fontana, Calif.; and Walter T. Aye, appointed assistant to the superintendent of yards and roads dept.

Harry J. Kingsbury, named director general of field operations, WILLYS-OVERLAND EXPORT CORP., in Europe, the Middle East and North Africa.

J. Howard Dunn, named manager sales development and engineering Div., Cleveland, ALUMINUM CO. OF AMERICA, Pittsburgh; Frank Jardine, becomes a consultant in automotive engineering and other problems; and George L. Moore, becomes assistant manager, Development Div., Cleveland.



W. F. COPP, appointed director of metallurgy and development, Wheeling Steel Corp.



RICHARD C. SMYTH, elected a vice-president, Arma Corp., Garden City, N. Y.



GEORGE E. STONE, becomes chief engineer, Basic Refractories Inc., Cleveland.

## Personnel

Continued

**L. W. Long**, named manager, Switchgear Dept., a newly organized department, ALLIS-CHALMERS MFG. CO., Milwaukee.

**Arthur D. Chaffee**, promoted to superintendent, Mechanical Maintenance Depts., SCOVILL MFG. CO., Waterbury, Conn.; and **Robert Weber**, becomes maintenance engineer, Manufacturing Depts.

**DeWitt O. Myatt**, appointed manager of development, ATLANTIC RESEARCH CORP., Alexandria, Va.

**Walter Schneider**, appointed contract manager, Fabrication Div., BUILDERS STRUCTURAL STEEL CORP., Cleveland.

**Ben Eldridge**, named product manager, Metalworking Div., The Delta Tool Div., ROCKWELL MFG. CO.; **Thomas C. Mortimer**, becomes product manager, Woodworking Div.; **I. G. Meyer**, appointed product manager, Homecraft Tools Div.; and **A. V. Taylor**, becomes product manager, Accessories Div.

**Philip D. Pearson**, appointed manager, Caland Ore Co., Canadian subsidiary of INLAND STEEL CO. olis.

**Norman L. Krey**, appointed manager of Northwest Operations, KAISER ALUMINUM & CHEMICAL CORP.

**George R. Sommers**, appointed director of marketing, Machinery Div., FOOD MACHINERY & CHEMICAL CORP., San Jose, Calif.

**F. M. Sloan**, named manager, Lamp Div., WESTINGHOUSE ELECTRIC CORP., Bloomfield, N. J.

**Kenneth F. Thomas**, appointed assistant treasurer, UNIVERSAL ATLAS CEMENT CO., New York.

**Arthur E. Murton**, vice-president, appointed manager, Pittsburgh office, CONTINENTAL FOUNDRY & MACHINE CO.

**Joseph L. Geenens**, appointed manufacturing superintendent, Edmore, Mich., plant Carboley Dept., GENERAL ELECTRIC CO.



RUDOLPH A. LANGER, elected president, American Metal Market Co., New York.



WALTER F. GREENWOOD, becomes assistant to the president, Cleveland Welding Co., Cleveland.



ROBERT F. RICHARDS named director—Material & Mfg. Control, The Engineering & Research Corp.



GEORGE M. BRYSON, appointed chief industrial engineer, Bethlehem Pacific Coast Steel Corp.

SEND FOR 248-PAGE  
**WILMOT CHAIN  
& CONVEYOR  
Catalog**



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of Rivetless Chain,  
Wilmot Offers Widest Choice of  
Chain Sizes and Conveyor Attachments



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CORPORATION  
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**POWDERMET  
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STORY NO. 17**



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**Personnel**

*Continued*

**Joseph K. Strickland**, joins testing equipment sales staff, New York, BALDWIN - LIMA - HAMILTON CORP.; and **Joseph P. Foley**, joins testing equipment sales staff, Cleveland.

**Samuel P. Felix**, appointed general manager, DE LAVAL TURBINE PACIFIC CO.

**Rollo W. Boring**, appointed sales manager, ROLLED ALLOYS, INC., Detroit.

**Robert R. Beetham**, appointed works manager, Hicksville Plant, AMPEREX ELECTRONIC CORP.

**L. B. Alley**, becomes sales manager, Chain Link & Ornamental Fence Div., CONTINENTAL STEEL CORP., Kokomo, Ind.; and **Jack E. Elliott**, becomes assistant sales manager.

**Irv R. Mairson**, appointed sales manager, COLLINS MICROFLAT CO., Los Angeles.

**Payne C. Barzler, Jr.**, named district manager, district sales in Houston, Texas, CHASE BRASS & COPPER CO., INC., Waterbury, subsidiary of Kennecott Copper Corp.

**John O. Bell, Jr.**, appointed district manager, Texas, APPLETON ELECTRIC CO.

**Fred Rogers**, appointed special representative, INTERSTATE MACHINERY CO., INC., Chicago.

**Harry A. Neff**, named a district sales representative, Indiana, C. A. NORGREN CO.

**Lewis F. Luckenbill**, appointed special sales representative, UNION TOOL CORP., Warsaw, Ind.

**OBITUARIES**

**Raymond L. O'Brien**, 65, president and general manager, Detroit Brass & Malleable Co., and for years a prominent figure in the gas industry, suddenly while in New York on a business trip.

**William L. Nelson**, 75, founder and president, International Screw Co., Detroit, recently at his home in Clearwater, Fla.

**Carl E. Johnson**, 69, chairman of the board and one of the founders of Sterling Electric Motors, Inc., at his home in San Marino, Calif., recently.

Planning a switch?—



By L. F. Spencer  
Chief Metallurgist  
Landers, Frary & Clark  
New Britain, Conn.

## How To FABRICATE 430 STAINLESS

♦ BECAUSE IT LACKS NICKEL, 430 stainless is harder to form than 302 stainless. It has about three fourths the formability of a low-carbon deep-drawing steel. Reduction on a cupping operation is between 20 and 25 pct compared to a 50 pct reduction in deep drawing 302. In redraw operations, 430's value is usually 15 pct against 15 to 20 pct for 302.

Type 430 has good mechanical properties compared with 302 stainless and a low-carbon steel. It lacks the work-hardening characteristics which show up in press working 302 stainless, however. Stress cracking is not as prevalent.

Stretcher strains, directional properties and a ropy condition may occur in press forming 430. Stretcher-strain markings usually occur in light-gage dead-soft material where the metal is stressed beyond the yield point. One remedy is to increase the thickness of the material. In some cases, stretcher-strain markings may be prevented by specifying a final skin pass at the mill. This will, however, lower the ductility of the material for subsequent drawing operations.

Directionality in type 430 strip and sheet is partly due to absence of cross rolling and to the low annealing temperatures used. The low annealing temperature precludes recrystallization.

The ropy condition, usually in press-drawn shells, is characterized by concentric rings on certain drawn surfaces. This condition usually occurs when the material is stretched during drawing instead of being allowed to flow over the

♦ If you plan to switch from 302 to 430 stainless you may have to revise tooling and fabricating procedures . . . While simple parts are easily formed, Type 430 offers some problems in more complicated shapes.

♦ Press-drawn parts will need larger blank sizes, higher hold-down pressures, increased radii . . . Reduction per draw will be lower . . . Additional draws and anneals may be needed.

♦ Clearances in blanking or punching are usually the same as for low-carbon steel . . . Greater leverage may be required in spinning 430 and spinning speeds will run 60 to 70 pct of speeds for mild steel.

die ring. Where roping is not too serious, a cutting or a hard-buffering operation may remove the defect and produce a smooth surface.

Where roping is severe, wall thickness of the drawn shell should be accurately gaged to determine whether stretching is taking place. In eliminating surface irregularities, use of a heavy-

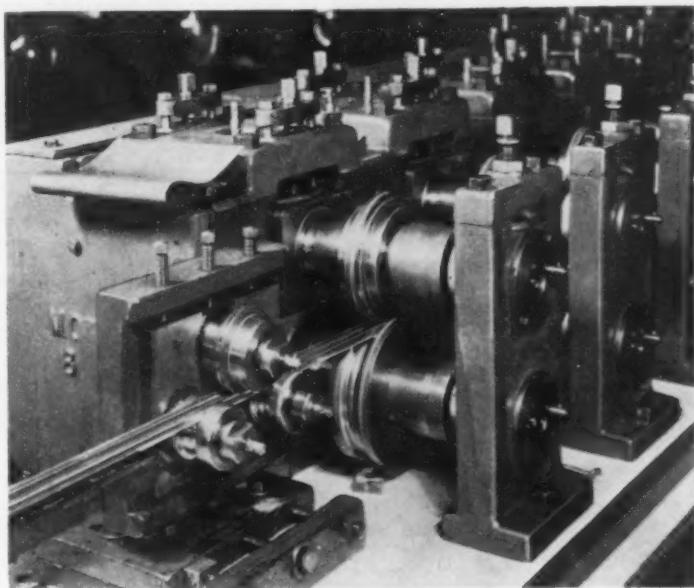


FIG. 1—Proper bend radii are important in form rolling sections like this 430 molding to be used for auto trim. Courtesy Republic Steel Corp.

**"In forming an intricate shape  
... operating sequences have  
been modified . . ."**

ier gage material than would be used in drawing 302, should be considered. Severity of individual draws can also be reduced. A greater number of drawing operations per part would also require more intermediate anneals.

Where relatively simple shapes have been formed from 430 there have been few changes in tooling or methods. But, in forming an intricate shape in several successive press draws, operating sequences have been modified and additional intermediate anneals were required to restore ductility.

Little difficulty should be experienced in shearing, blanking, piercing or perforating 430 stainless. However, due to 430's relatively higher strength values, compared to carbon steels, rigid equipment, heavier backing of dies and ample power are necessary. Sharp cutting edges should be maintained since the chromium-stainless compositions tend to drag along a cutting edge.

Strip stock paid off reels for blanking requires sufficient tension to prevent cobles and damaged surfaces. Burrs which may retard metal flow between draw ring and hold-down pad in subsequent press operations should be removed.

Clearances used in blanking or punching operations are usually the same as for carbon steels. In perforating 430, minimum hole size is usually the thickness of the material. For 302 stainless, this value is usually 1½ to 2 times metal thickness. Step punches are recommended where a number of closely spaced holes are to be made.

Due to 430's directional properties, liberal radii should be provided in bending. If possible, the angle of bend should be at 90° to the rolling direction. Minimum angle should be 45° to the rolling direction.

For a 90° bend on material over 0.050 in. the inside radius should be at least twice the metal thickness. On material under 0.050 in., a 180° bend can be made flat upon itself if the bend is opposite the rolling direction. Where bends parallel the rolling direction, inside radii should be at least twice the metal thickness.

Where a 180° bend is made on stock over 0.050 in., a bend radius at least twice the metal thickness is needed where the bend direction is opposite the rolling direction. Bend radii should be increased to four times the metal thickness where the bend direction parallels the grain.

In form rolling 430, Fig. 1, use of proper bend radii is important. This fabrication method is frequently used in making moldings. Rolls must be designed to give proper reductions and to prevent premature failure due to use of sharp-edge rolls.

#### Use paper to protect surfaces

Brake-forming dies should be polished. Where polished sheets are formed, surfaces should be protected by gluing kraft paper to the sheet. This protective paper can easily be removed after fabrication has been completed. Fig. 2, an example of successful brake forming, shows a vertical shelf-rack support and molding for a Philco refrigerator. Parts are made in lengths to 50 in. from 0.035-in. gage stock 3¼ in. wide. Operation sequence is as indicated. Close inspection is required due to the severity of the operation.

Selection of finish depends upon the nature of the forming. Finishes available for cold-rolled 430 are similar to those for 302. The 430T analysis will not have as bright a surface as type 430 in some cases. Surface requirements should be checked carefully.

In press drawing 430, provisions should be made for higher hold-down pressures, increased radii and lower reduction per operation. Blank size for drawing should be about 10 pct larger than with type 302. This larger blank size plus less effective hold-down pressure allows the metal

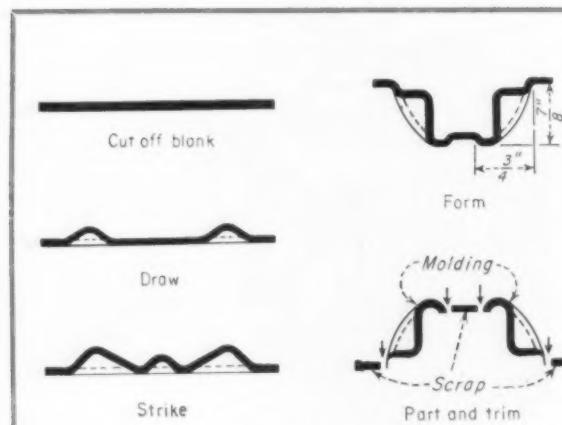


FIG. 2—Severe brake forming is possible with 430. Sequence shows forming of refrigerator shelf support.

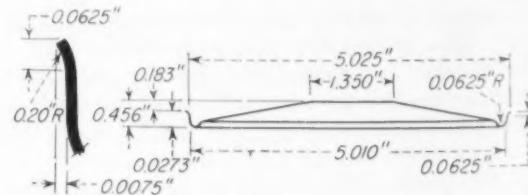


FIG. 3—Simple forms such as this cup part can be drawn with no change in tools or procedures used with 302.

to flow over the die ring rather than "neck down" locally and eventually fail through cracking. Since the surface may be smoother than that experienced with a 302 blank, effective hold-down will be lower even though hold-down pressure may be higher.

Highly polished and hardened dies, exceptionally good lubrication and slower press speeds are necessary. While this alloy will not permit the severe deformations experienced with 302, it can be worked into many intricate deep-drawn parts. Some operating sequences used for 302 would also be used with type 430. The relatively simple forms illustrated in Figs. 3 and 4 were processed from 430 without change of tools or procedure. The part shown in Fig. 4 was produced in several steps with no intermediate annealing.

Fig. 5 is a hub cap formed from 430 on dies made to produce the part from 302. Increased hold-down pressure was needed to compensate for higher finish on 430. Forming operations were: Draw oversize and bulge top; recess center; flange down to final shape. Directional lines were readily removed by polishing.

#### More clearance may be needed

No change in tooling was necessary when the four-draw sequence in Fig. 6 was converted from 302 to 430. An intermediate anneal was required after each draw, however. Reduction on the first cupping operation, about 33 pct, was considered exceptionally good. Reductions of 25 pct, 20 pct and 20 pct respectively were obtained on subsequent redraws. An attempt to redraw without annealing the cup was partially successful. The first redraw shell was made without fracture. Excessive wrinkling on the side walls however made an anneal between cup and first redraw necessary. The washing machine tub, Fig. 7, and the kitchen sink, Fig. 8, are other examples of deep-drawn parts made from 430.

In some cases, the difference between success and failure in drawing 430 was in the clearance.

Experience showed the clearance provided was often insufficient. Galling and pickup may be evidence that clearance is at fault.

Generally, the clearance required for drawing operations will be about the same or a little greater than that for a carbon steel. Press speeds should be between 35 and 40 fpm. Drawing radii should be liberal and the draw ring should be well polished or buffed. Due to the

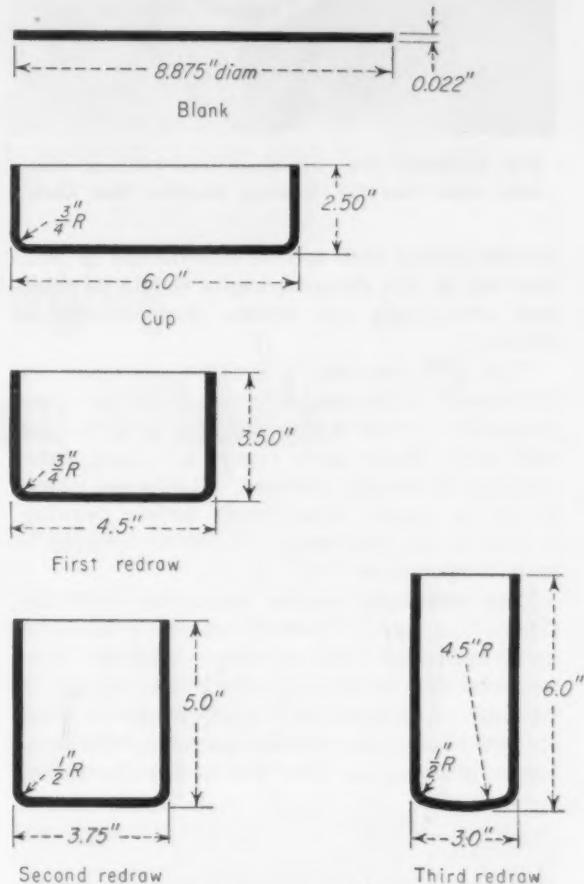


FIG. 6—Intermediate anneals were needed after each step in this draw sequence. Tools were not changed.

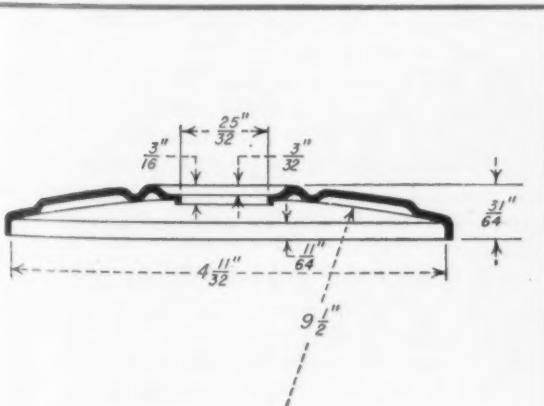


FIG. 4—No intermediate anneal was needed between forming operations in making this 430 stainless part.



FIG. 5—Dies used to form this 430 hub cap were made for 302. Greater hold-down pressure was needed with 430.

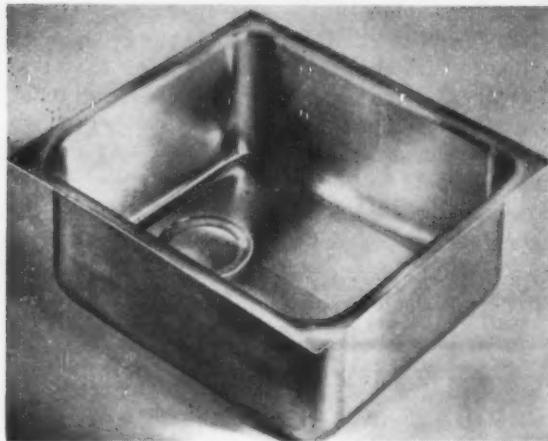


FIG. 8—Kitchen sink, deep-drawn from 430, was originally made from 302. Courtesy Republic Steel Corp.

greater pickup that may be experienced in press drawing of 430, die components should be examined periodically and defects removed with an oil stone.

Type 430 requires a greater allowance for springback in formed parts usually two or three times that needed in drawing similar parts from mild steel. Some users report 430 stock draws better if previously warmed. Blanks are dipped in boiling water immediately before drawing. In any event, cold stock should be brought to room temperature.

Tool materials require particular attention. Where tool design permits, use of a tungsten water-hardening steel provides a slippery, hard, wear-resistant surface. Where tool design is intricate, a high-carbon high-chromium steel, air or oil hardening, is recommended. Hardened bronze draw rings, Bhn 430 to 360 are recommended. The centrifugally cast bronze ring is preferred. Alloyed cast iron has also been recommended as a draw-ring material.

The lubricant used in press drawing 430 requires a higher film strength than that used for

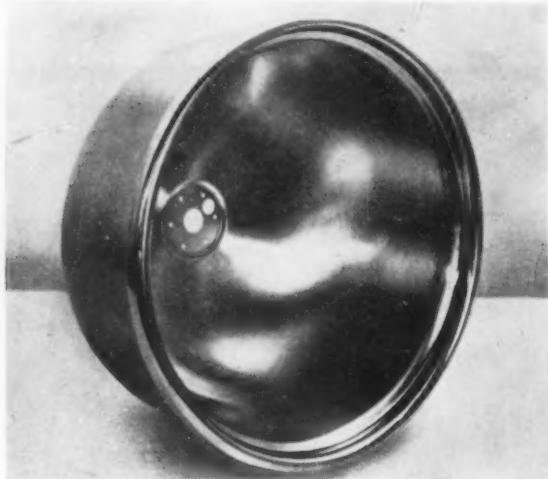


FIG. 7—Washing machine tub deep-drawn from 430. Larger blank sizes are usually needed in deep-drawing 430 parts.

**"Oils and waxes on formed articles should be completely removed to avoid surface damage . . ."**

302. This is especially true in deep drawing. The "dry film" lubricant used in drawing 302, is only partially successful on 430. A lubricant used with considerable success, especially in reverse drawing, combines a heavy-duty base, such as International 359 diluted with alcohol. Three pounds of base are mixed with each gallon of alcohol. This composition dries slowly.

Carbon-tetrachloride can be used to speed the drying process, but adequate ventilation is essential and in many instances, approval must be obtained from the State Board of Health. As the alcohol or carbon-tetrachloride evaporates, the surface of the part becomes quite sticky. The material in this condition can be subsequently deep drawn. The lubricant is quite easily removed with a 1 pct alkaline spray wash. The lubricant should be removed before the film dries hard.

**Need greater leverage in spinning**

Little difficulty should be experienced in spinning 430 stainless though more frequent anneals may be required. Greater leverage may be required. The metal can be spun at about 60 to 70 pct of the speed used for mild steel. Larger radii may be necessary.

Intermediate anneals and subsequent descaling operations are needed in forming 430. Annealing temperatures will vary from 1100° to 1450°F. Time at temperature should be just sufficient to insure thorough heating which is followed by an air cool. A process anneal at 1300°F works quite well as an intermediate treatment between press draws. Where a full anneal is needed the upper temperature limit should be watched closely. Lengthy soaking at high temperature may cause undesirable grain growth and subsequently a brittle structure. Slow cooling in the range of 750° to 1000°F may also lead to brittleness.

Oils and waxes on formed articles should be completely removed to avoid surface damage to the material. To avoid distortion, light sections may be air cooled. Where design permits, heavier annealed sections may be water quenched. A hardness of RB 82 can be expected after a full anneal.

Type 430 is used to a considerable extent for cold-heading applications. An annealing cycle recommended by Armeo Steel Corp. includes: (1) Heat to 1500° to 1650°F for 2 to 3 hr; (2) Slow furnace cool to about 1000° to 1200°F; (3) Air cool to room temperature. This treatment is used only in special cases for while it produces a slightly lower hardness, it also reduces notch toughness.

Scale can be removed from press-drawn material by pickling. Several solutions effectively remove scale deposits. One is an 8 to 12 pct sulfuric acid solution in water. Operating temperature is 150° to 170°F. Another is a 6 to 10 pct hydrochloric acid solution in water. Operating temperature is 130° to 140°F. A suitable inhibitor is generally required. Time and temperature must be closely watched so scale can be removed in a minimum of time.

A mixture of 20 parts sodium hydroxide by weight and 5 parts potassium permanganate by weight is recommended where a light, uniform scale on a dense surface is to be removed. Operating temperature is 230°F. Parts are immersed long enough to remove the scale, then bright

dipped in a 20 pct nitric acid solution.

The DuPont sodium hydride descaling process is particularly advantageous in removing scale from 430. Parts are first immersed in a molten solution of sodium hydroxide which contains from 1.5 to 2.5 pct sodium hydride at 750° to 800°F. A water quench dislodges much loosened scale. Next a bright acid dip removes any remaining scale and brightens the part. Suitable rinses follow.

This patented process permits uniform scale removal without loss of metal during pickling. There is no pitting upon prolonged immersion and scale removal is rapid. Another method of scale removal developed by the Kolene Corp. is an electrolytic process using a molten salt.

## It's Worth Salvaging Your Old Grinding Wheels

• A SALVAGE DEPARTMENT, well organized to reclaim, sell and put to new uses many types of salvaged items, is a huge asset in a large plant. Such is the case at the Buick Motor Div. plant in Flint. Among the salvageable items are grinding wheels which, after becoming chipped or worn so they no longer perform efficiently, are sent to the salvage department for recutting to usable sizes.

The wheels are first checked against the overall grinding needs of the plant. If they can be salvaged economically, they are cut to usable sizes or types. This applies chiefly to wheels of large size where the cost of resizing is justified by value or demand for the new size.

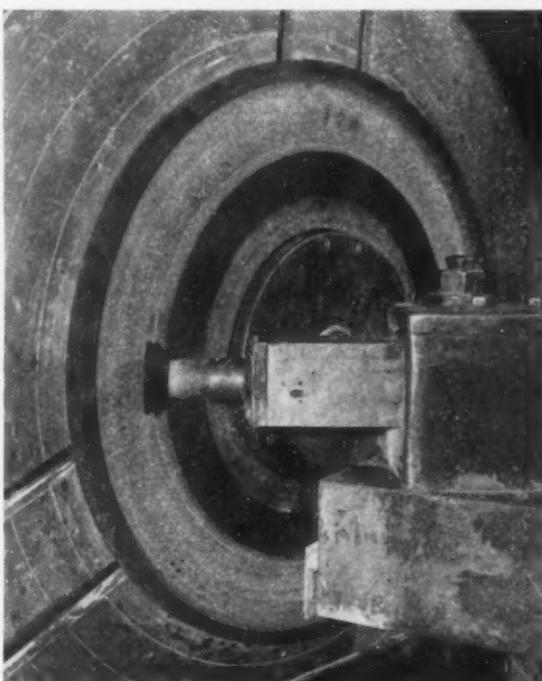
Recutting is done in a lathe installed specifically for the purpose. It is equipped with a 56-in. chuck or faceplate. It also has a carriage and holder to support and feed a rotary dished 45° hardened cutting tool. A variable-speed drive provides a range of speeds for the different types of wheels which vary in diameter from 4 to 42 in., have thicknesses up to 4 in. and are of many different grits.

Salvageable wheels are centered, clamped in the chuck and generally given a first facing cut by feeding the rotary cutter across one face. If the hole size needs to be increased, a flanged clamp is applied at the center and the original hole is turned to specified size. When necessary, the wheel is turned over and finished on the remaining face.

Many wheels are large in diameter and have a high initial cost. Consequently, the savings are considerable on such wheels. Losses which would be incurred by scrapping the wheels are

eliminated and the wheels are given a new span of life. When wheels finished to commercial sizes are not needed in the plant, they may be sold to the salvage department.

Cutters for the machine are relatively inexpensive and generally resize from three to ten wheels of an average 30-in. diam. The machine is equipped with an exhaust system to remove abrasive particles cut from the wheels.



DISHED ROTARY CUTTER makes a cut along one face of a grinding wheel being resized for a new job.

**Proportioned heat—**

# Uniform Annealed Grain Size Obtained WITH RADIANT-ROOF FURNACE



By C. R. MacWhirter  
Chief Engineer  
Drawn Metal Tube Co.  
Thomaston, Conn.

♦ Radiant-roof burners in a pan-type annealing furnace develop heat patterns to suit job . . . Once adjusted, each of 27 burners delivers its proportionate share of heat and compensates for nonuniform heat losses.

♦ Reduced gas-air ratios are constant and accurately mixed to minimize oxidation . . . Asbestos curtains and bottom venting confine furnace atmosphere.

♦ PAN-TYPE annealing furnaces present the problem of keeping work temperatures uniform across the hearth. A recent furnace installation at the Drawn Metal Tube Co., Thomaston, Conn., overcomes this condition by compensating for nonuniform heat losses. It is done with a gas-fired radiant furnace roof which develops heat patterns to meet operating requirements by on-the-job adjustments.

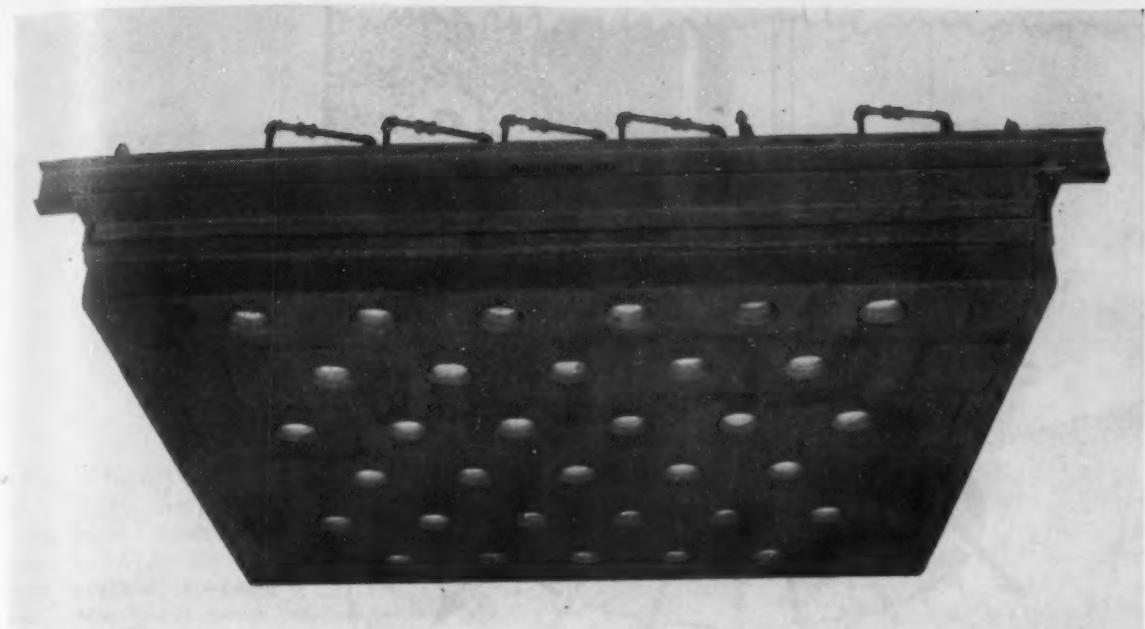
The furnace is used for direct-fired annealing of copper, brass and nickel-silver tubing in diameters from 3/64 to 5/8 in., with wall thicknesses from 0.005 to .032 in. Lengths range from 20 ft to a few inches.

Following cold reduction on draw benches, ap-

proximately 1000 lb of tubing are piled to a uniform depth in a steel or steel-alloy pan, then drawn through the furnace during a 20-min heating period. This loading is 1 to 3 in. deep, depending on unit weight of the tubes. Pans are attached end to end and drawn by side chains connected to a variable-speed drive.

The stress-relief anneal is done at 600° to 800°F while intermediate anneals and the full anneal are done at 1000° to 1200°F. The relief anneal removes residual stresses which, if present in service, might cause season cracking. The full anneal leaves the material soft for further cold working.

Products of combustion from this direct gas-



RADIANT ROOF of pan-type annealing furnace has burners arranged for patterned heating. Once adjusted,

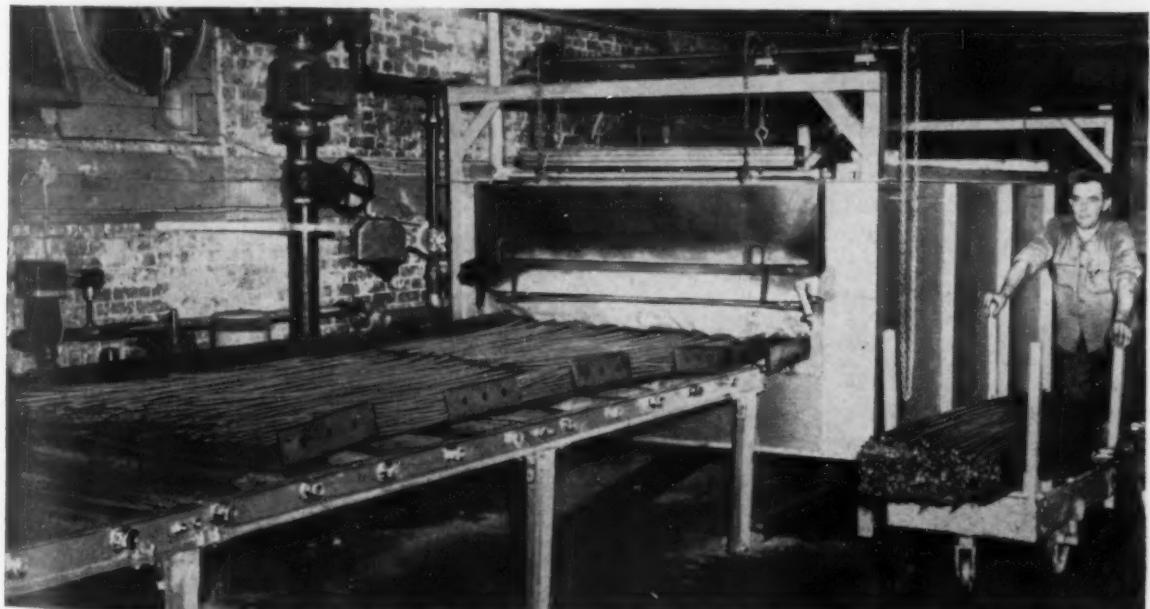
each burner delivers its share of heat in an overall pattern to compensate for nonuniform heat losses.

fired furnace may come in contact with the work, but the tube surface is easily cleaned by brief immersion in a dilute dichromate or sulfuric acid bath. Oxidation is minimized by keeping reducing gas-air ratios accurately proportioned and constant, and by partially confining furnace atmosphere with asbestos curtains and bottom venting.

The furnace which has an overall length of 14 ft was built by Selas Corp. of America. It

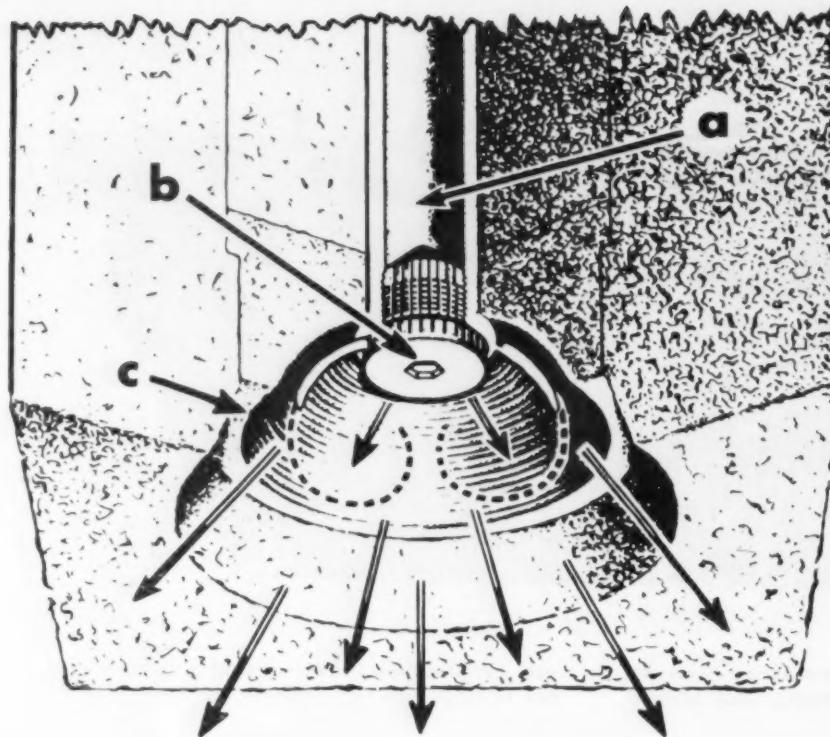
has a balanced lift-type door on each end. Its flat-arch top is built in two sections, each having an automatic temperature control. Multiple flues in the side walls vent combustion products from a level below the work. This prevents chimney action and resultant excess oxidation.

The furnace roof is constructed with 27 heavy-duty radiant burners, arranged in lateral rows of five and four, alternately. Uniform work temperatures cannot be obtained with all burners



WORK LOAD enters heat chamber of radiant-roof furnace for annealing and subsequent cold working. To

minimize oxidation, furnace atmosphere is partially confined by asbestos curtains and bottom venting.



GAS-AIR MIXTURE enters burner through mixture tube (a), is distributed through numerous radial slots in tip (b) and burns completely within ceramic cup (c).



GRAIN STRUCTURE of low-leaded high brass at 75X before (left) and after (right) annealing. Grain size



after annealing is uniform throughout a pan load of tubing. Actual grain size measures 0.40 mm.

consuming equal amounts of fuel or by using side burners only as in conventional practice. Work-temperature uniformity results from progressively throttling burners in each row from the sides toward the center. Once adjusted, each continues to develop its proportionate share of heat in the overall pattern as zoned temperature controls call for more or less heat.

During operation, the gas-air mixture from a combustion controller enters through a mixture tube and is distributed through numerous

radial slots in a tip. The mixture burns against the walls and entirely within a ceramic cup. The combustion controller used permits individual burner throttling without adversely affecting air-gas ratios.

The significance of this type of furnace is that grain-size differences in samples taken throughout the pan load cannot be detected. Samples of low-leaded high brass from numerous points in the furnace show a uniform annealed grain size of 0.040 mm.

# Transfer Machine Combines Rough and Finish Milling

♦ COMPLETE CONTROL of two operations at one point plus greater output per sq ft are illustrated in a transfer-type milling machine installed in Ford Motor Co.'s Highland Park, Mich., plant. The Motch & Merryweather machine combines rough and finish milling operations on both ends of the cylinder blocks in the new Ford overhead-valve engine.

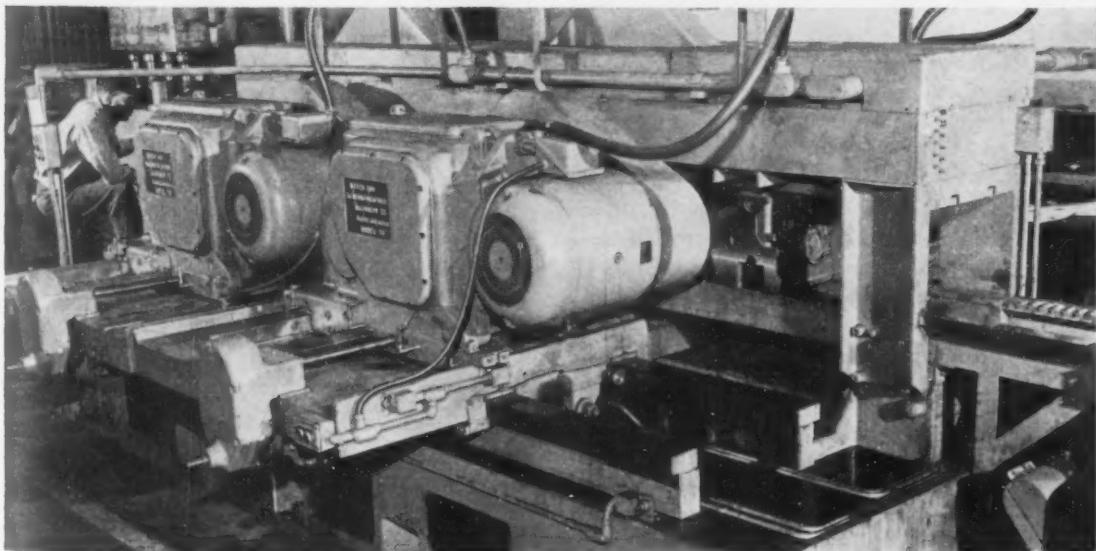
This type of arrangement provides better tool control since rough and finish cutters being at the same station can be removed at the same time, if required. Blocks can be stockpiled for subsequent operations when the machine is shut down for a complete tool change. Milling heads are mounted on a common base sturdy built to overcome minor vibrations.

The independently-controlled milling heads are driven off separate shafts so that vibrations resulting from roughing are not transmitted through the heads to the finishing operation. As a result the machine can produce cylinder blocks smooth and parallel to within 0.002 in. Cutters can be changed without crawling into the ma-

chine as heads mounted on sub-slides have power adjustment in and out of the machine which permits them to be run back free of the clamping fixtures. Micrometer dials are used for close adjustment.

Milling heads are 75-hp capacity units, with 40 hp motors on the roughing spindles and 30 hp motors on the finishing spindles, especially built for carbide milling with no splined shafts. Both heads use 15-in. diam carbide cutters run at 250 fpm for rough and 200 fpm for finish milling. Rate of feed is 60 ipm and the machine is rated to produce 105 blocks per hr at 100 pct efficiency.

Location for both operations is taken from the same spot, reamed holes in the oil pan face. Clamping is done by an overhead bridge-type hydraulic clamp. The block must be properly located and securely clamped before the milling heads will move. The bed of the machine is designed to receive, collect and discharge chips automatically. The ribbing and baffling feeds the chips onto a power driven conveyor accessible from either end of the machine.



Motch & Merryweather mill for milling both ends of cylinder block for new Ford tractor engine.

**Corrections indicated?**

# New Tests on Steel Suggest ERROR IN POISSON'S RATIO



By W. D. Manley  
Oak Ridge National Laboratory  
Oak Ridge  
Tenn.

- ◆ Oak Ridge tests indicate that hot-rolled steel's modulus of elasticity is 28,000,000 . . . shear modulus is 11,000,000. Accepted figures have been higher.
- ◆ Poisson's ratio is apparently closer to 0.25 than to 0.30 based on strain gage tests checked three ways.
- ◆ These tests were limited to 18,000 psi stress . . . The method might show accepted values at higher levels.

◆ AT STRESSES up to 18,000 psi Poisson's ratio for hot-rolled steel is between 0.23 and 0.25—and not 0.29 or 0.33 as the literature states. Whether this 0.23-0.25 ratio would apply at higher stresses cannot be determined with the test equipment used to fix the new lower range. But this much is a fact: The 0.23-0.25 figures were found in three different types of tests on a total of 16 specimens. Further, the same test method yields figures for aluminum corresponding closely with those currently accepted in the literature.

The tests described here were made in connection with work on nuclear reactors. The project required a means of determining the modulus of elasticity and Poisson's ratio of the reactor metals with a high degree of accuracy.

Test specimens were made from  $\frac{3}{4}$ -in. diam hot-rolled 1020 bar stock. The diameter of the section was machined to the root diameter of a  $\frac{3}{4}$ -in. thread since the specimen had ten  $\frac{3}{4}$ -in. threads on both ends for gripping the specimen in the machine. Four Baldwin type A-1 SR-4

strain gages were placed on the specimens, Fig. 1. The strain measurements were made with a type K SR-4 strain age indicator and an SR-4 Wheatstone Bridge, (Fig. 2). Strain readings were taken at intervals of 250-lb load up to a total of 5000 lb, and from these readings the modulus of elasticity and Poisson's ratio were calculated. A total of six bars were pulled

TABLE I  
**ORNL TESTS ON STEEL**

Specimen Number	Average Modulus of Elasticity	Poisson's Ratio	Calculated Shear Modulus
1	$28.5 \times 10^6$	0.235	11.5
2	$28.3 \times 10^6$	0.245	11.3
3	$28.2 \times 10^6$	0.218	11.6
4	$29 \times 10^6$	0.243	11.8
5	$28 \times 10^6$	0.238	11.5
6	$28.3 \times 10^6$	0.237	11.5
Average	$28.3 \times 10^6$	0.238	11.5

TABLE III  
**COMPRESSION TEST RESULTS**

Specimen Number	Modulus	Poisson's Ratio
1	$30.1 \times 10^6$	0.259
2	$28.1 \times 10^6$	0.209
3	$29.3 \times 10^6$	0.248
4	$30.1 \times 10^6$	0.257
5	$30.4 \times 10^6$	0.281
Average	$29.8 \times 10^6$	0.247

Oak Ridge National Laboratory is operated for the U. S. Atomic Energy Commission by Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp. The company is making a special effort to cooperate with industry in releasing unclassified material developed at Oak Ridge.

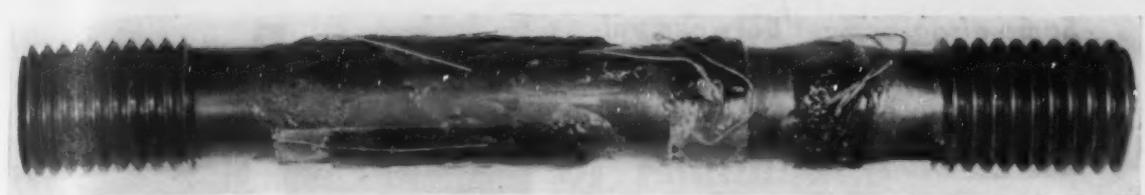


FIG. 1—Tensile specimen with four SR-4 strain gages to measure longitudinal and circumferential strain.

originally, with calculated average values as given in Table I.

Since these results were in contradiction with the accepted value for Poisson's ratio of steel, and it was possible that the experimental tech-

niques could be questioned, similar test bars were tested in the metallurgy laboratory at NEPA.\* There an entirely different apparatus

\* Nuclear Energy for the Propulsion of Aircraft project.

TABLE II

NEPA TESTS ON STEEL

Specimen Number	Tension		Compression			Tension			
	Loading		Loading			Loading		Loading	
	1	2	1	2	3	1	2	3	
1. Modulus	30.3	30.3	30.5	30.5	30.5	30.1	30.3	29.9	
1. Poisson's Ratio	0.231	0.258	0.217	0.179	0.218	0.227	0.225	0.208	
3. Modulus	30.3	.....	30.7	.....	.....	30.0	30.1	30.4	
3. Poisson's Ratio	0.227	.....	0.224	.....	.....	0.242	0.236	0.232	
4. Modulus	31.7	32.0	31.4	31.8	.....	29.7	30.4	30.4	
4. Poisson's Ratio	0.200	0.231	0.224	0.224	.....	0.270	0.230	0.232	
5. Modulus	30.0	.....	32.0	29.8	.....	29.4	30.9	30.2	
5. Poisson's Ratio	0.233	.....	0.225	0.227	.....	0.226	0.235	0.224	

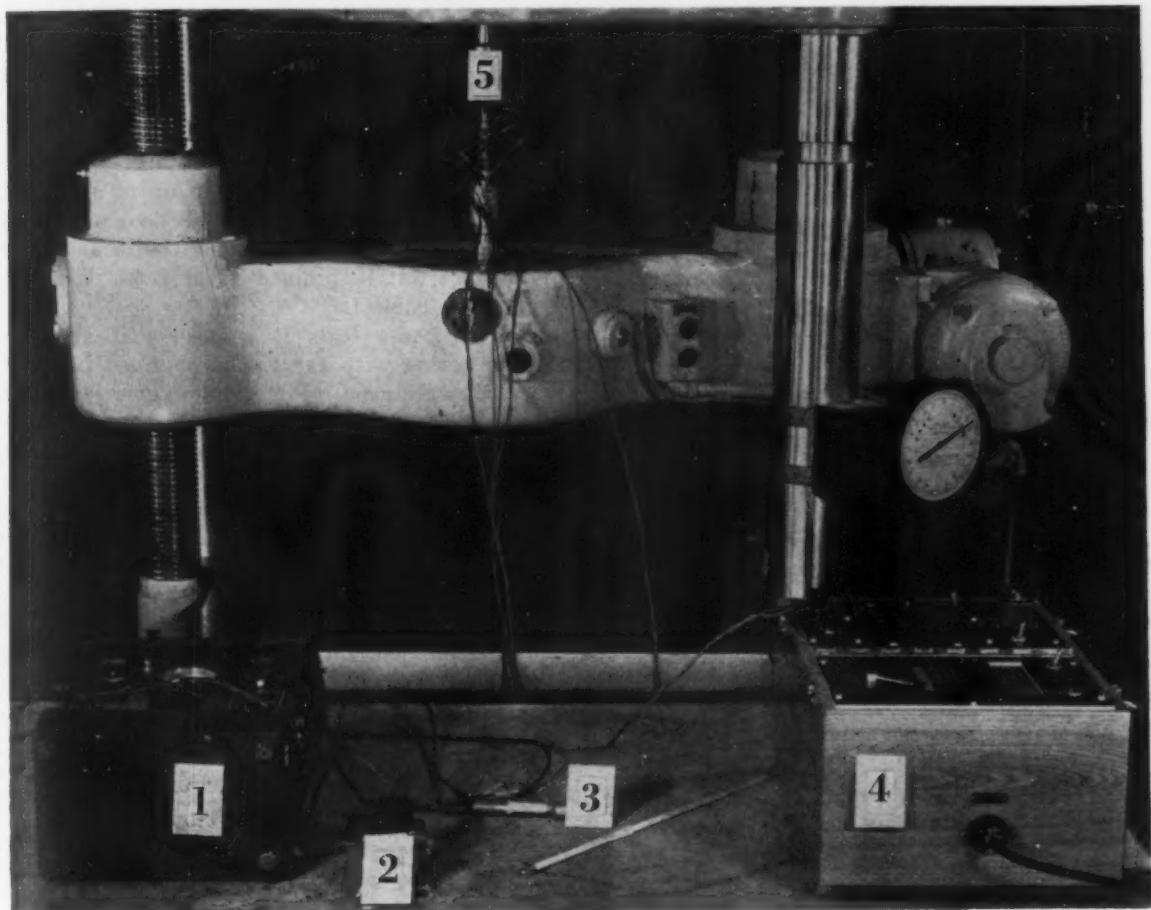


FIG. 2—Experimental setup used to determine Poisson's ratio and modulus of elasticity. (1) SR-4 strain gage indicator; (2) Low resistance double throw switch;

(3) Dummy specimen for temperature compensation; (4) Wheatstone bridge for measuring circumferential strain; and (5) the test specimen.

**Some disagreement between values may stem from stress levels at which measurements were made.**

was used, and type AX-5 strain gages were placed on the bars. The values for Poisson's ratio determined at NEPA (Table II) closely checked the original ORNL tests.

The values of Poisson's ratio obtained from all the six original samples were then plotted as a function of stress to determine the amount of scatter and if there was any variation of Poisson's ratio as a function of the stress level. In Fig. 3 it can be seen that above a stress level of 4000 psi the values of Poisson's ratio show only a slight amount of scatter from there to a stress

TABLE IV  
ALUMINUM TENSILE TESTS

Specimen Number	Modulus	Poisson's Ratio
1	$10 \times 10^6$	0.324
2	$10 \times 10^6$	0.335
3	$10 \times 10^6$	0.341
Average	$10 \times 10^6$	0.333

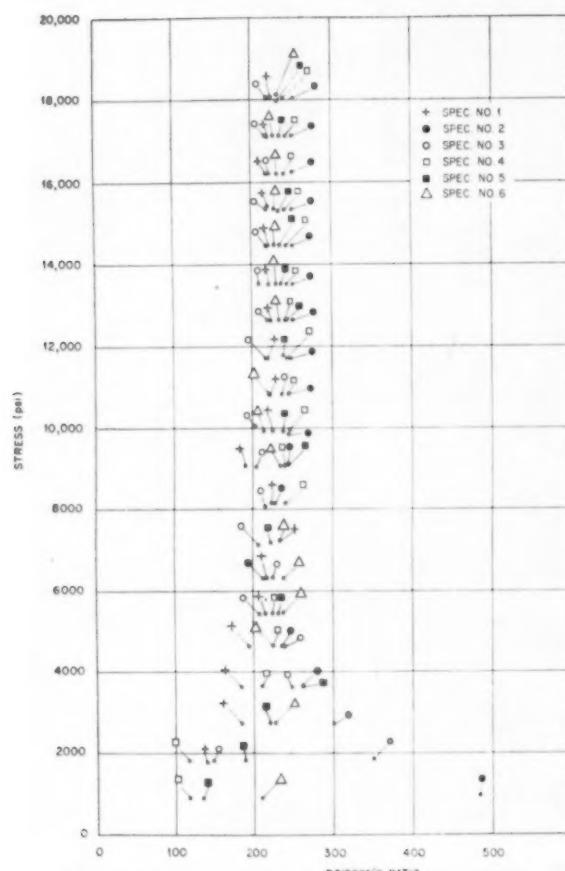


FIG. 3—Poisson's ratio of 1020 steel as a function of stress level averages 0.336 from these plots.

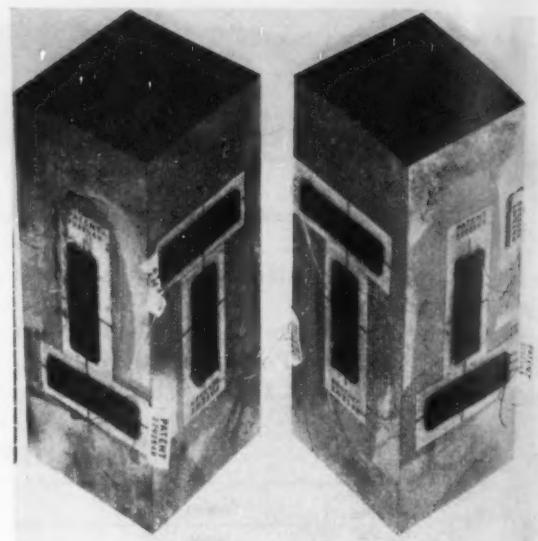


FIG. 4—Eight SR-4 gages were attached to compression specimens to measure longitudinal and lateral strains to check the results obtained from tensile tests.

level of 18,000 psi, the highest value reached in this work.

It was thought possible that the specimen configuration and the way in which the strain gages were bent around the diameter of the specimen might have caused an error in the original work. Therefore, five large compression samples of hot-rolled 1020 steel were fabricated. They are 2.02 in. square and 5.05 in. long. Eight type A-1 SR-4 strain gages were applied to the compression samples (Fig. 4). These specimens were loaded at intervals of 5000 lb up to a total of 80,000 lb which is roughly equivalent to a stress of 18,000 psi. The values for the modulus and Poisson's ratio obtained from these tests are given in Table III.

From these tests it is seen that Poisson's ratio agrees with the values obtained from the tension specimens (Fig. 3 and Table I). So it is unlikely that the type of specimen and configuration of the strain gages can account for this low value of Poisson's ratio.

Three bars of aluminum were tested in a manner identical to that used on the tensile specimens. Table IV summarizes these results.

It is possible that part of the disagreement between the values of Poisson's ratio determined by this method and those previously reported is due to the stress level at which the strain measurements were made.

#### Acknowledgment

The author wishes to acknowledge the help of Mr. John Dragic of NEPA, and now of General Electric Co., who confirmed the results as mentioned in the text. The author is also indebted for advice and assistance to Mr. J. C. Wilson, Physics of Solids and Mr. W. H. Brand of the Instrument Dept., Oak Ridge National Laboratory.

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2. Strain Gage Bulletins, Baldwin-Lima-Hamilton Corp., Philadelphia.

# Machining Practices Affect Mechanical Properties of Aluminum

GOOD MACHINING PRACTICE is important to the strength and quality of products made of heat-treated aluminum. Tests conducted by Harvey Machine Co., Inc., Torrance, Cal. show that serious losses in tensile and yield strengths occur when dull tools overheat the work. The findings are particularly important because it is impractical to exercise supervision over all machining operations, and inspectors cannot detect weaknesses due to overheating.

In the first tests, four sets of duplicate flat tensile specimens were taken from extruded shapes of 755-T6 alloy. These flats were prepared by milling one set with a sharp, well designed cutter. The duplicate set was prepared with a dull cutter with insufficient clearance angle. Specimens were taken adjacent to each other to avoid variables other than temperatures attained during machining. The results are shown in Table I.

The strength characteristics of these specimens were compared with those of similar specimens submitted to measured furnace temperatures. From this comparison, it was apparent that tem-

peratures reached during machining with the dull cutter exceeded 500°F for about 2 min. If this temperature had been maintained for 5 min, as could occur in a heavy milling cut, tensile strength would have been lowered by about 20,000 psi.

Tests were also made of specimens of alloy 24S-T4 which were prepared in a similar manner. With this alloy, maximum reduction in tensile strength due to overheating with the dull cutter was 8 pct and maximum reduction in yield strength was 31.6, see Table II. Overheating had no appreciable or predictable effect upon elongation characteristics.

In a third phase of the tests, random 0.505-in. diam test bars were turned from 1 5/8-in. diam extruded rod on a lathe turning at 1200 rpm. Six bars were cut with a sharp tool and six with a dull tool, using no coolant in either case. The alloy was high strength, HZM11-T6, an experimental aluminum-zinc magnesium-copper alloy. In these tests average reductions of both tensile and yield strengths were about 20 pct.

TABLE I  
ALLOY 755-T6, PREPARED BY MILLING

Specimen	Tensile Strength, Psi			Yield Strength, Psi			Elongation, Pct in 2 In.	
	Sharp Cutter	Dull Cutter	Pct Reduction	Sharp Cutter	Dull Cutter	Pct Reduction	Sharp Cutter	Dull Cutter
1	90,000	82,000	8.9	80,000	70,000	12.5	10.0	10.0
2	88,000	78,000	11.4	80,000	67,000	16.2	11.0	10.0
3	92,800	79,000	14.9	82,500	69,000	16.4	10.0	12.0
4	98,300	82,000	5.0	77,700	69,000	11.2	9.5	8.5
Average Reduction 10.1 pct			Average Reduction 14.1 pct					

TABLE II  
ALLOY 24S-T4, PREPARED BY MILLING

Specimen	Tensile Strength, Psi			Yield Strength, Psi			Elongation, Pct in 2 In.	
	Sharp Cutter	Dull Cutter	Pct Reduction	Sharp Cutter	Dull Cutter	Pct Reduction	Sharp Cutter	Dull Cutter
1	63,000	60,000	4.8	46,750	32,000	31.6	18.0	15.0
2	62,750	60,100	4.2	47,250	37,000	21.7	18.0	14.0
3	65,500	62,000	5.3	50,000	41,000	18.0	17.0	17.5
4	63,600	58,500	8.0	45,800	40,500	11.6	20.0	19.0
Average Reduction 5.6 pct			Average Reduction 20.7 pct					

TABLE III  
ALLOY HZM11-T6, TURNED ON LATHE

Tensile Strength, Psi		Yield Strength, Psi		Elongation, Pct in 2 In.	
Sharp Cutting Tool	Dull Cutting Tool	Sharp Cutting Tool	Dull Cutting Tool	Sharp Cutting Tool	Dull Cutting Tool
97,750	68,750	68,750	59,250	10.0	9.0
95,700	62,500	66,500	74,500	9.0	8.0
97,750	73,500	67,500	65,500	8.5	8.0
98,000	80,000	87,500	72,000	9.0	8.0
99,125	87,250	89,250	80,000	8.0	8.0
97,000	76,000	85,500	65,750	8.5	8.0
Average 97,554	78,000	87,500	69,666		
Difference	-20.0 pct		-20.4 pct		

**Three in one process—**

# COLD EXTRUSION Ready to Invade Metalworking Markets



By D. I. Brown  
Technical Editor

- ◆ The first cold-extrusion plant is ready to start commercial production . . . Prototype products have been produced and methods proven.
- ◆ Process combines finish, size and final properties in one operation . . . Saves machining and in cases, finishing and heat-treating steps.
- ◆ More parts for same amount of steel can be made . . . Carbon steel can sometimes be used instead of alloy in parts requiring up to 110,000 psi tensile strength.

◆ KOLDFLO EXTRUSION combines more manufacturing processes into a single operation than does any other metalworking method. Because of this inherent advantage, commercial applications are bound to increase. The three major features wrapped into one in this cold extrusion method are (1) surface finish, (2) accurate size and (3) final mechanical properties.

Although all three of these major requirements may not be simultaneously achieved in cold extruding certain parts, at least two are fully met in most applications.

The table lists briefly the limits or ranges of what can be done in producing commercial products. If part tolerances need not be better than  $\pm 0.005$  in., machining is not necessary unless threading, drilled holes, etc., are involved. If a 50-microinch surface is satisfactory, the as-extruded part need not be further finished. If the mechanical properties needed in the finished part don't exceed those shown in the table, heat treatment can be dispensed with except in cases where softening is wanted. In this case, the finished part can be tempered, annealed or normalized but some sacrifice in size due to distortion and surface finish is usually encountered.

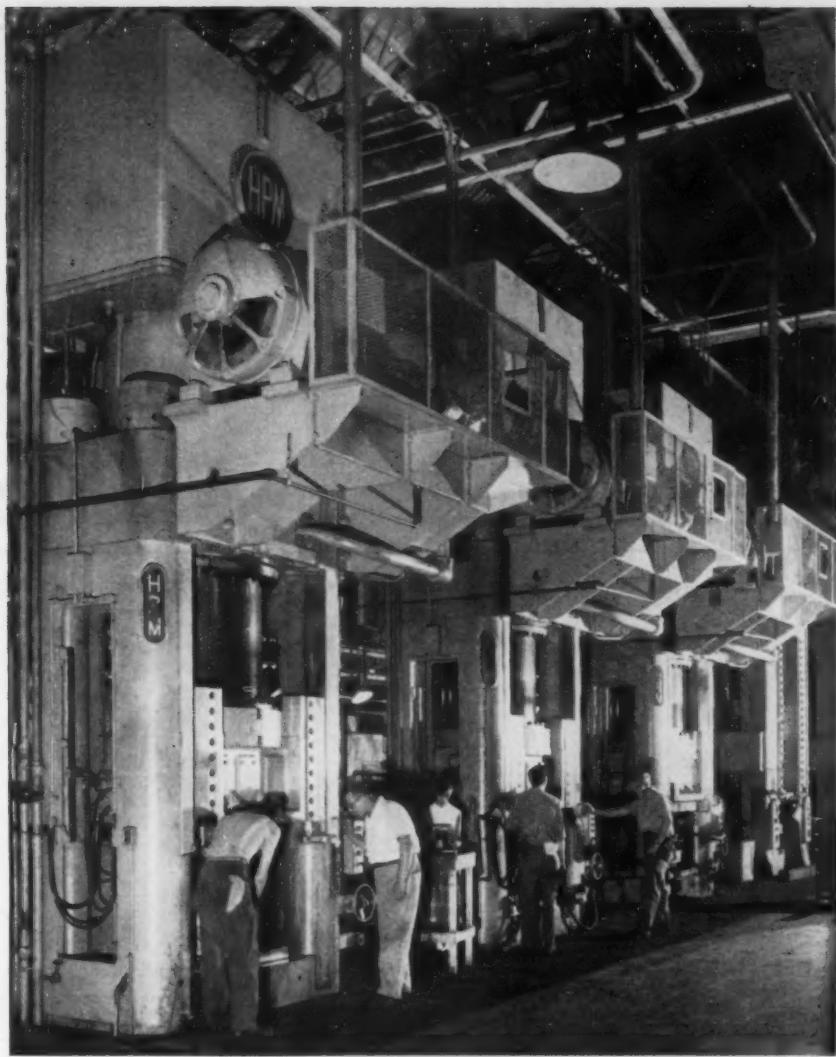
The major principles involved in the cold-ex-



CUTOFF MACHINES cut billets from hot-rolled bars in preparation for cold extrusion.

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HYDRAULIC-PRESS line at Liberty Plant of Mullins Mfg. Co. features four 4000-ton presses. Extruded parts weighing up to 26 lb can be made in this shop.



trusion process have been previously described in these pages.<sup>1</sup> The first big tonnage application for military use was completely described here also.<sup>2</sup>

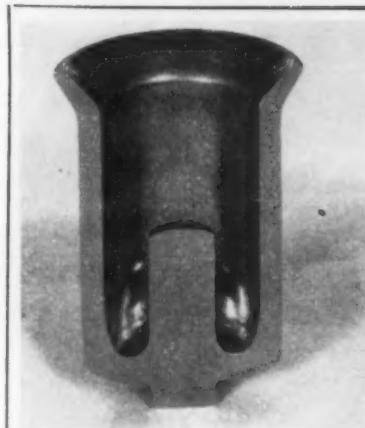
Mullins Mfg. Co. has erected and is now operating the largest cold-extrusion shop in this country at its Liberty Plant just outside of Warren, Ohio. Chief product of this plant has been artillery shells but possible peacetime products have been developed. The company has made and tested a number of commercial parts and is making these parts at their new shop at Warren. Facilities at Liberty are capable of producing cold-extruded parts up to 26 lb. The major equipment includes four 4000-ton presses and two 2000-ton presses plus a mechanized-Bonderizing and annealing line.

Koldflo, as defined by Mullins, is a process for cold shaping steel by displacing metal under compression. By a proper combination, forward and backward displacement, coining, expanding, ironing, and compressing can all be accomplished with this process. Besides savings in machining time or welding together of a number of pieces

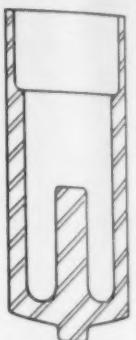
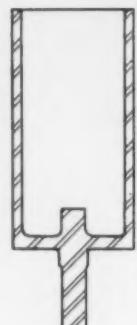
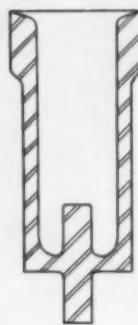
to make a complete part, Koldflo can preclude the use of alloy steel in cases where heat treating up to RB 100 maximum hardnesses were formerly involved. The process is not limited to



MATERIALS HANDLING of shells between operations is highly mechanized. Note overhead conveyors.



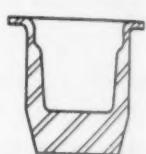
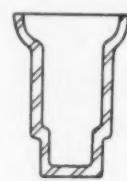
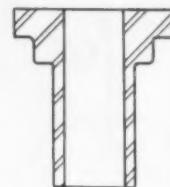
ONE-PIECE hydro-spring cylinder extruded from 1012 steel has replaced a three-piece machined and brazed



part made from 4130 alloy. Above part is cold-nosed to complete the required shape, weighs 2 lb, 1 oz.



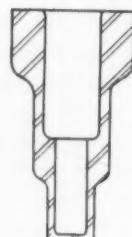
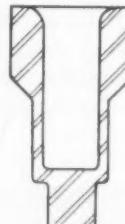
HEAVY FLANGED sleeve has sharp radii. Parts are not limited to straight-wall cylinders and multiple flanges



are possible as shown in cross-section drawings. Savings in machining are great on this type of section.



OFFSETS, both inside and outside can be made in any combination and number. Concentricity of walls is ob-



tained without machining. Offset available on only one wall if desired, as shown in drawings.

cylindrical shapes, although the largest present applications fall in that category.

The process is capable of great savings in metal. Little or no discard is involved as the slugs cut from the bar stock are extruded into exact shapes with no flash or cutoff sections left over. Biggest waste is the metal lost as saw-cuttings when the slugs are cut from bars. In

#### THE COLD FACTS

Size: Major tolerances held to 0.005 in.

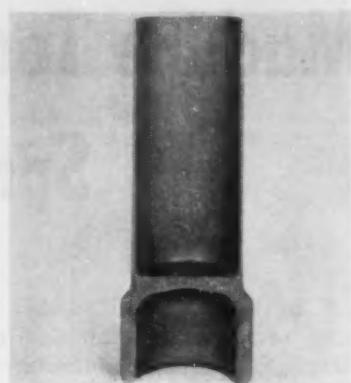
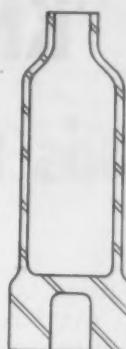
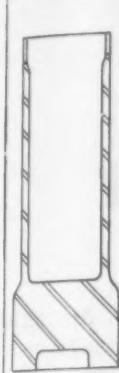
Finish: 50 microinches minimum

Tensile Strength\*: 110,000 psi max.

Yield Strength\*: 95,000 psi max.

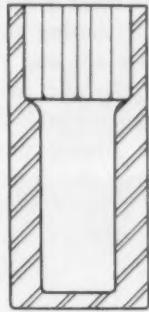
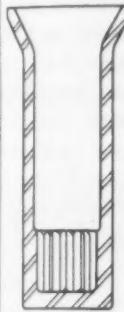
Hardness, RB\*: 90 to 100

\*SAE 1010 or 1020 steel.



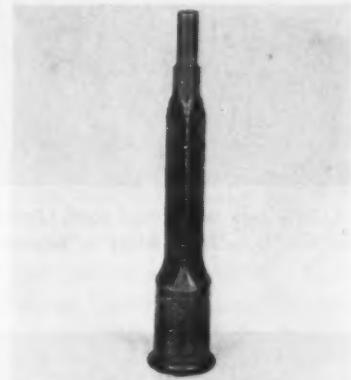
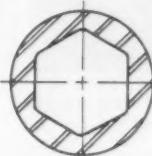
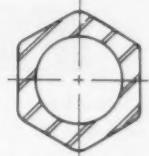
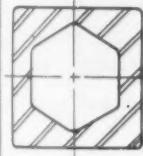
DOUBLE EXTRUSION, forward and backward will produce integral web at any desired point on length of tube.

Drawings show variations of this product made by Koldflo. Many commercial and some military parts are like this.



FLUTES OR LANDS can be made on inside or outside surfaces. Drawings indicate that any length or combina-

tion of flutes with smooth inside and outside surfaces can be produced by the cold extrusion process.



KOLDFO is not limited to cylindrical shapes. Photo shows combination where part is round inside and out-

side at top and bottom and is square inside and outside in center. Drawings show other possibilities.

some cases, Koldflo has saved as much as 98 pct of the steel which was lost in fabricating the same part by other methods.

Licensing agreements are being extended to other fabricators. A number of such licenses have been granted. Cold-extruded parts other than shells are now being made which weigh from 2 to 20 lb.

#### References

<sup>1</sup>T. E. Lloyd and E. S. Kopecki, "Cold Extrusion of Steel," THE IRON AGE, Aug. 4, 1949, p. 90.

<sup>2</sup>D. I. Brown, "Cold Extrusion of 105 mm Shells Save Steel," THE IRON AGE, Oct. 19, 1950, p. 69.

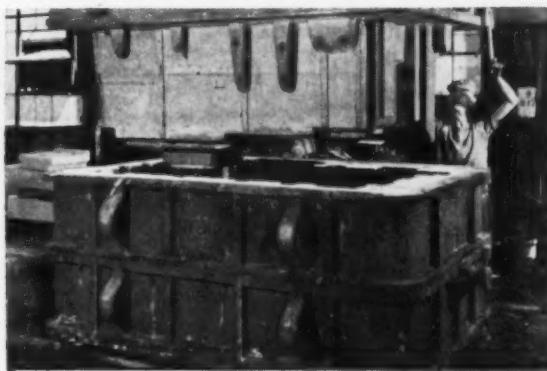
# Machine Tool "KNOW HOW" Spreads to Subcontractor

◆ SUBCONTRACTING DEFENSE items became advisable for the Continental Gin Co., Birmingham, Ala., manufacturer of cotton ginning machinery, shortly after the Korean outbreak. Rather than seek contracts for expendable, high production items requiring a complete rearrangement of shop facilities and extensive retooling, the company decided to offer its capacity for machine tool production.

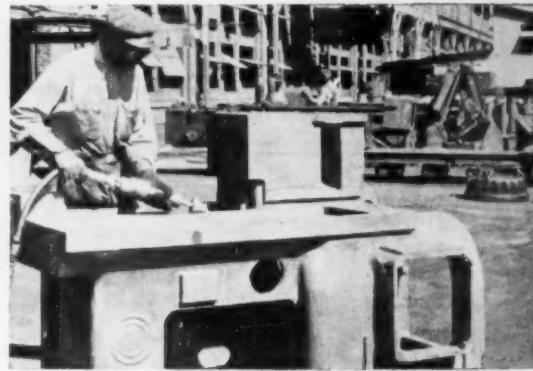
Arrangements were made with the Gisholt Machine Co. in mid-1951 for building this company's No. 12 hydraulic automaite lathes. This lathe was selected primarily because of (1) its medium size, (2) patterns and tooling could be transferred from the Gisholt plant without interfering with other production and (3) additional output of this item would relieve the

heavy backlog at the Gisholt plant. An initial order of 100 lathes was followed by the transfer of complete patterns, tooling and manufacturing information.

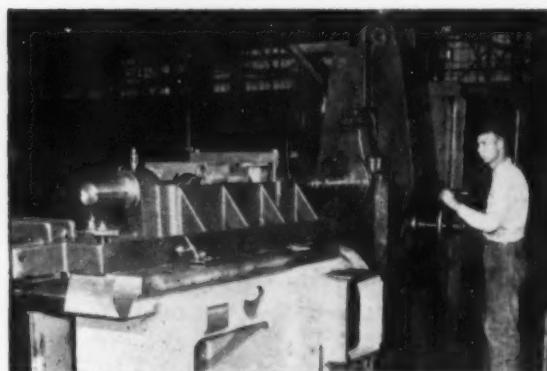
The numerous techniques and "know how" required in building machine tools, however, brought up numerous problems which were successfully solved by cooperation between the two firms. The most difficult of these included modification of tooling to fit machine tools in Continental's plant and yet leave them suitable for re-use by Gisholt, interpretation and amplification of specifications and drawings, instructions for fitting parts and testing complete assemblies, and enlargement of facilities to achieve quantity production. The photos below show operations in Continental's plant.



ROLLING core into a bed mold. Pattern and flask equipment was transferred intact to subcontractor.



CLEANING lathe bed. Experienced skilled and semiskilled labor was available for this type of work.



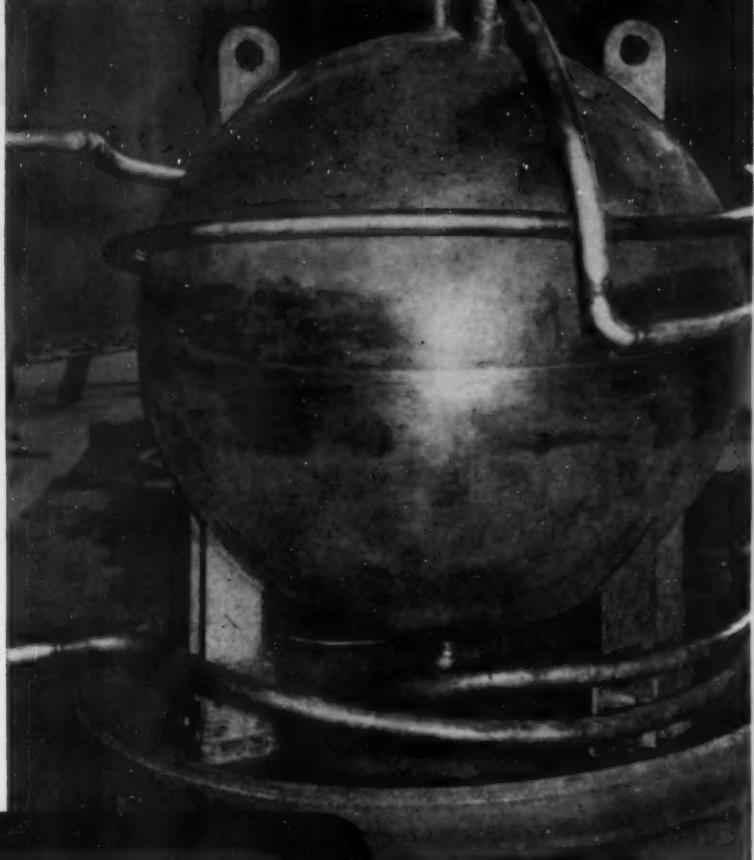
BORING fixture shipped from Gisholt is used with horizontal boring machine called back into service.



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IS  
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# Technical Briefs

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## SAFETY:

**Steel industry accident rates down to new lows.**

Continued emphasis on safety rules and precautions is enabling the steel industry to ring up new lows in infrequency rates of work injuries.

On the basis of preliminary totals as tabulated by the Bureau of Labor Statistics, the steel industry and its labor force were able to cut down disabling accidents during 1952 to 12 pct less than the 1951 rate.

This compares favorably with manufacturing industries as a whole which turned in an average frequency rate of 13 pct less than the 1951 record.

## Time Loss Low

Visitors to American steel plants from the United Kingdom have been amazed at the low accident rate and relatively small loss of working time because of plant injuries.

One such group recently told THE IRON AGE that widespread use of materials handling equipment as well as strict enforcement of safety measures and the use of safety equipment is a major reason why American steelworkers have a lower rate than British.

For example, where American plants used mechanical equipment for handling items weighing as little as 40 or 50 lb, British workers used manual handling for objects weighing much more, one plant superintendent pointed out.

Also, the average British steelworker was reluctant to wear steel-capped shoes and negligent in the use of protective goggles and helmets.

## Steelworkers Safer

Best steelworker record continued to be turned in by workers on blast furnaces and related facilities for ingot production. This is indicated at 6.1 injuries for each 1 million man-hours of work. Last year's rate was 6.4 injuries.

This puts the blast furnace and

## IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 111. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

steelmill workers in sixteenth place on the list of 140 manufacturing categories for which BLS keeps separate records. Overall manufacturing rate was 13.5.

It is likewise the best record in all metalworking categories except aircraft production (3.6) and motor vehicles (4.9).

Parts-makers for both aircraft and motor vehicles have slightly higher rates of 7 and 7.1, respectively.

## Other Industry Rates

Injury frequency rates for the remaining 6 steelmaking categories, according to preliminary calculations, are as follows:

Gray iron and malleable foundries, 31.7, highest in all metalworking groups except manufacture of metal doors, sash and trim where the rate is 41.4; steel foundries, 25.3; iron and steel forgings, 22.6; pipemaking, 20.2; wire drawing, 13.6; and cold-finished steel, 12.9 injuries per 1 million hours of work.

## Metalworking In Middle

Both the highest and lowest injury frequency rates occur outside the metalworking industries, BLS tabulations show.

Lumber production outdistances all other occupations by far with rates of 89.5 for logging and 54.6 for operation of sawmills.

Lowest rate is found in synthetic fiber mills where the frequency is 1.4. Workers in the manufacture of explosives tie with aircraft manufacture for fourth low with a rate of 3.6.

### SPOTWELDING:

Rotating electrode simplifies handling of big wing tanks.

A rotating electrode designed for use in a large spotwelding machine has simplified fabrication of large external wing tanks at Ryan Aeronautical Co.'s San Diego plant.

Largest ever designed, the fuel cells are of spotwelded aluminum alloy construction. To speed production, production engineers installed tracked conveyer systems to eight large spotwelders.

### Tank Sections Unwieldy

By making the lower electrodes of these spotwelders rotatable, one man can push the tank sections between the 60 in. jaws of the machines. Without the retractable electrodes, it requires four men to lift the unwieldy tank sections over their interior bulkheads as the spotwelding is shifted from one seam to another.

Because of the massive bulk of the machines, it is not possible to employ an overhead crane system like that used to load the sections on the tracked dollies.

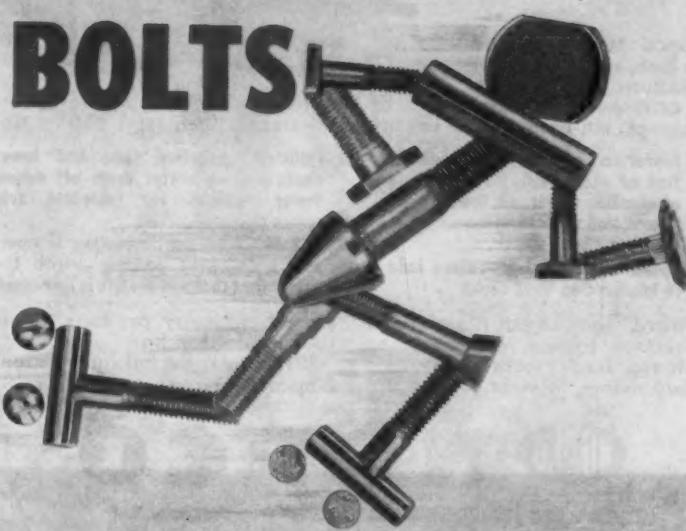
Operated by foot control, the rotatable electrode swings from a vertical to horizontal position to



HYDRAULIC CONTROLS rotate lower electrode of large spotwelding machine so large tanks sections may be moved into machines with greater ease.

Turn Page

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## Technical Briefs

provide 10 in. of added clearance between the electrode arms. The movement is accomplished by a hydraulic cylinder and piston which pulls a yoke down.

### Mounted On Shaft

A pin in this yoke is keyed into an "L"-shaped slot in the lower electrode assembly. The copper electrode is mounted on a horizontal shaft firmly attached to the electrode arm. As the yoke descends, it rotates the electrode into a horizontal position.

The electrode is also actuated in another direction. The yoke is wedge-shaped, laterally, and moves in and out against steel roller bearings as it rotates the electrode. Thus, as the electrode moves into the upright position, the wedging action of the yoke pushes it tightly against the electrode arm to form a firm electrical contact.

The assembly is designed to operate on the same line water pressure used for cooling electrodes. The hydraulic cylinder converts this 50 psi pressure into 400 psi for a fast, positive rotation of the electrode.

### COUPLING:

**Stainless steel piping joined easily with Neoprene ring.**

Stainless steel piping is often difficult to thread and to weld. To meet this problem, a coupler with rubber coaling ring bonded inside such as is widely used in the chemical industry has been developed.

Cooper Alloy Foundry, Inc., Hillside, N. J., who developed the Quickup, found the rubber ring presented a manufacturing problem. It was difficult for rubber processors to turn out a Neoprene compound that would do the job.

Engineers of Minnesota Rubber & Gasket Co., Minneapolis, studied the job and developed a series of sealing rings. These are made from "Neoprene W" with close quality control. The process resulted in a substantial resistance to compression set—15 pct at 70 hr at 212°F.

The injection molding process used guarantees the close tolerances required in assembly.

*Turn Page*

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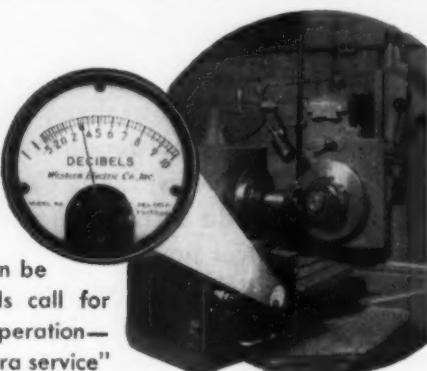
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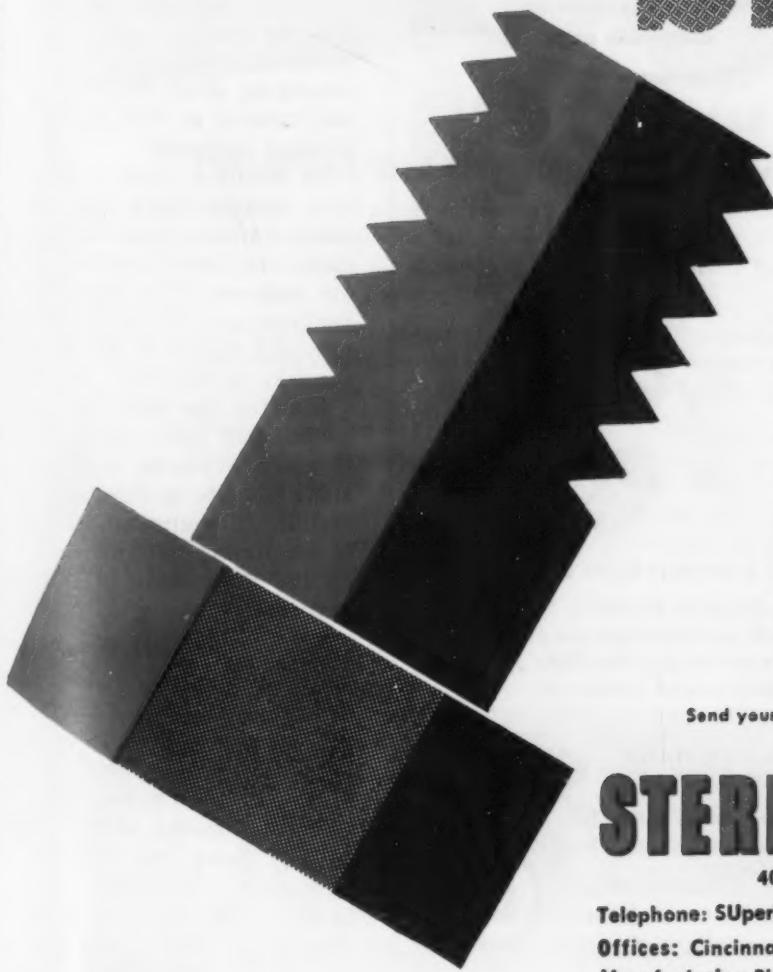
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## —Technical Briefs—

### SKY HOOKS:

Use of roof bolts in mining operations continues to grow.

Expensive and cumbersome timbering in mines is gradually being replaced by roof bolts. A recent report by the Bureau of Mines indicates that within 2 years the number of mines in the Rocky Mountain area using roof bolts

has more than doubled. Reduced costs and fewer mine accidents have impressed many mine operators.

The roof bolts are simple steel rods that pin up mine roof or overhead rock in place of timbering.

#### Now 604 Mines Use Bolts

Seven years ago, Bureau records show, there wasn't a single coal

mine in the country that employed a systematic plan of roof bolting. Today, there are 604. An additional 117 mines that produce metals and nonmetallic minerals now support their roof rock with bolts, which are inserted in drill holes and anchored.

By binding or tying together several thin rock strata to simulate a thick beam, they provide additional strength across a mine opening and greater safety for miners working underneath.

Despite its recent wider use, this type of roof support is not new to the mining industry. A Wyoming coal mine tried it 30 years ago. Moreover, roof bolts were installed in an underground lead-zinc mill at Gilman, Colo., 20 years ago, and in the mill level tunnel at the Telluride mines in Colorado a decade ago.

#### Output Higher

Cost savings have resulted in increased output per man in fewer roof falls and lower maintenance. Reports from operators of mechanized mines show production gains averaging about 30 pct per man and ranging as high as 110 pct in isolated instances.

In addition, bolts require far less storage space than conventional timber or steel sets, and handling and transportation charges are reduced. Other important advantages are that roof support is provided within a few inches of the face or heading.

Blasting has little or no effect on installed bolts. More clearance is made available overhead and along the ribs or sidewalls for operation of equipment. Resistance to ventilating currents is reduced by the elimination of posts and crossbars.

#### Slit-rod and Wedge

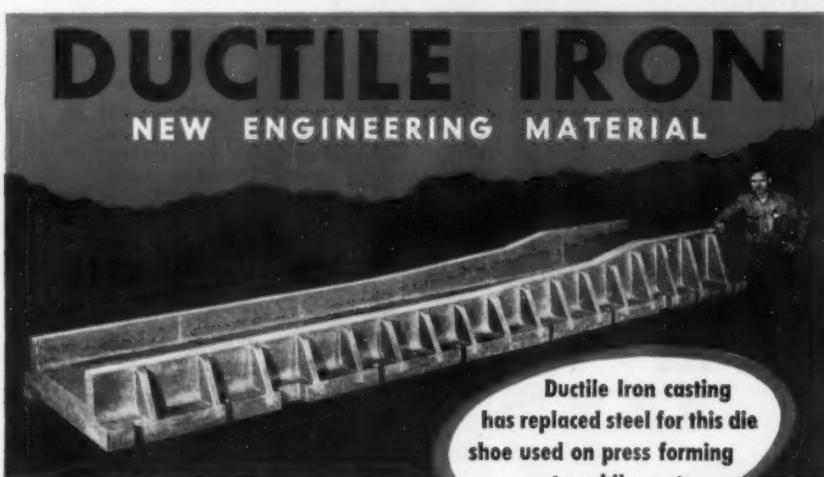
About 75 pct of bolts and anchoring devices used are the slit-rod and wedge type. The bolts are steel rods usually about 1 in. in diam and 5 or 6 ft long, slit at one end and threaded at the other.

After holes are drilled in the mine roof, a steel wedge is placed in the slit and that end of the bolt then is inserted in the hole and

Turn Page

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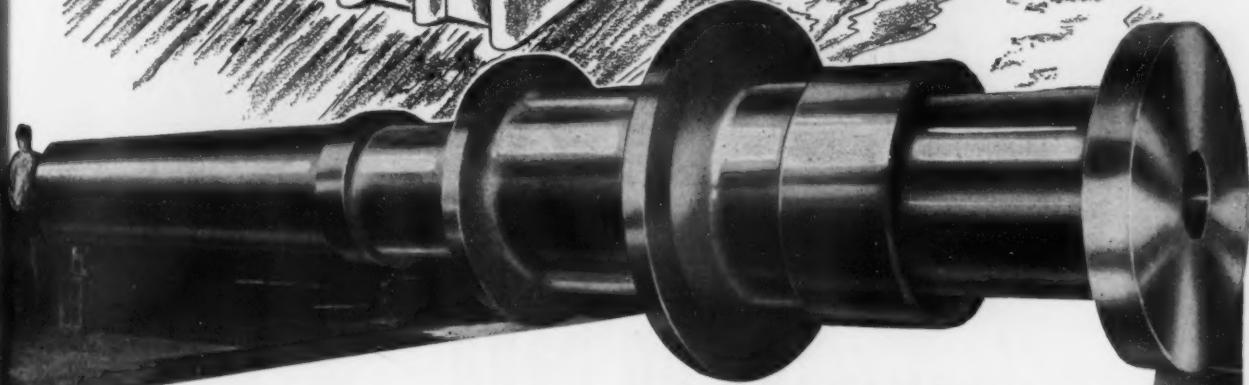
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## —Technical Briefs—

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The wedge spreads the bolt just as a screwdriver spreads a cotter pin, anchoring it securely against the sides of the borehole. A steel bearing plate and a nut are placed on the protruding end of the bolt and the nut is tightened with an impact wrench, completing the installation.

### Not A Panacea

Roof bolting is not a panacea for averting all roof failures. Neither is it adaptable to all roof conditions found in American mines. Each mine must be considered a special problem with the nature of its roof conditions determining whether bolts can be used and, if so, the best spacing and angles for driving them.

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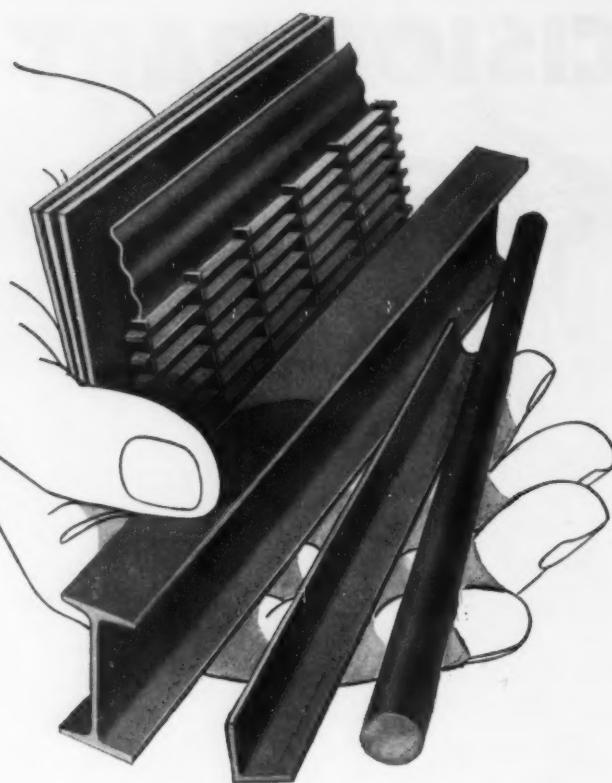
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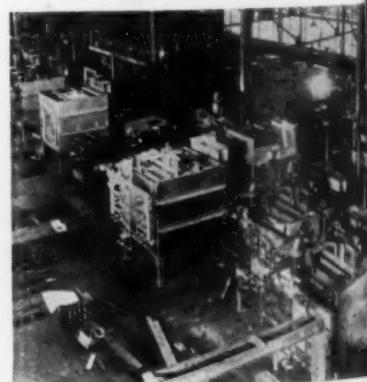
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## Technical Briefs

### OPTICAL GAGING:

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High-intensity light from within the cabinet is reflected by a system of mirrors across the part and back through the optical system to the viewing screen. The image on the viewing screen may be magnified up to 100 times.

#### Adjustments Simple

The 34-in. broach locating fixture is locked on the contour projector. On this base is mounted a broach carrying slide and indexing head. The slide is moved on the ways by turning whichever pinion

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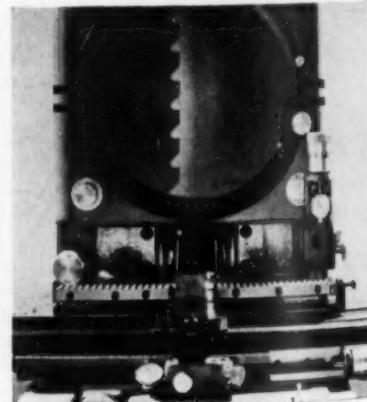
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AS FIXTURE is indexed across front of gaging instrument, entire length of the broach is checked.

meshing with the rack attached to the rear of the slide. The broach, on the fixture, rests against mounting blocks of the indexing slide member and against a magnetic stop at the end of the slide.

When checking various teeth, the broach is indexed across the path of the optical system. The indexing head is fixed to the base member of the fixture, and carries two special metal mirrors which can be moved as a unit in and out between the teeth of the broach to positive stops at each end of its travel.

### TRANSFER MACHINE:

Compound drilling at high production rates possible.

Automated machining operations have gradually demanded more and more complex drilling operations. Three factors—accuracy, speed and complexity of compound drilling—are involved.

A recently developed transfer machine for drilling and tapping auto engine blocks, has simplified drilling of accurate holes at compound angles at high speed.

The machine drills oil holes running at compound angles from the camshaft main bearings to the oil gallery hole. It also drills and taps a hole in the pan rail on one side of the block.

### On Roller Conveyer

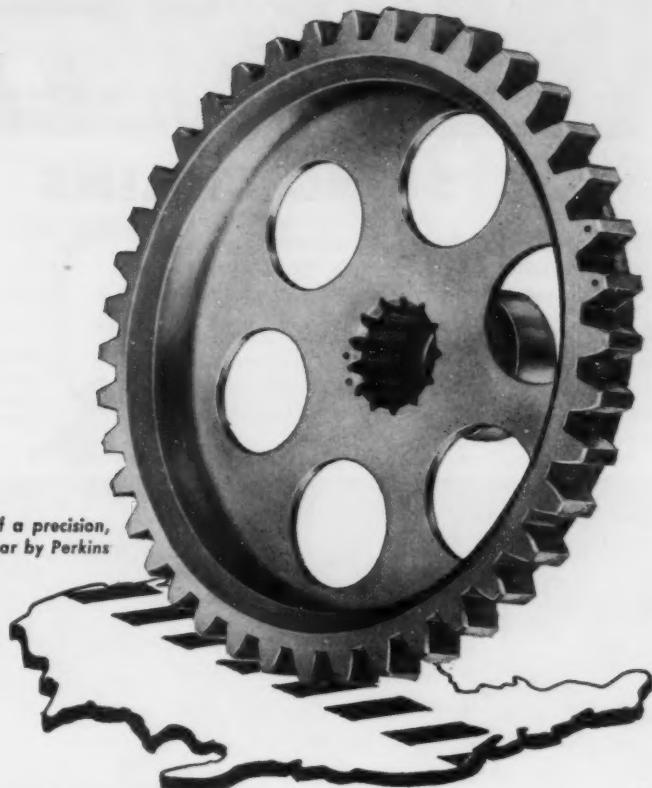
As cylinder blocks approach the machine on a roller conveyer, they are transferred to a fixture that has been shuttled out and into convenient loading position. The block is located endways on the fixture from the pan rail and two locating holes.

As the table shuttles back into drilling position, an air cylinder clamps against the top of the block to hold it securely against the fixture and stabilize it against drill pressure, which is at an angle upward against the block. Simultaneously, the locating pins also move up into the two locating holes.

Once the fixture and block are in position, the cycle start button is pushed to energize two of the

Turn Page

Typical example of a precision, custom-made gear by Perkins



**Across the Nation**

**on countless products**

**you'll find the "imprint"**

**of Perkins custom-made Gears!**

for no matter how good the product may be . . . if the component gears are custom-made by PERKINS it will be a better product. Long experience coupled with New England craftsmanship is a potent and hard-to-beat factor in the production of precision gears.

**You Furnish the Specifications  
We'll Produce the Gears**

**PERKINS MAKES:**  
to customers' specifications, in all materials, metallic and non-metallic: bevel gears, ratchets, sprockets, ground thread worms, spiral gears, helical gears, spur gears with shaved or ground teeth. Have us quote on your requirements.

\* A new product is the **PERKINS PRECISION SPRING COILER**. This coiler (patent applied for) turns out precision springs—any type, shape, size from wire sizes .005 to .125. Complete data and prices upon request.

\* Another new product—the **PERKINS "BENDIT 15"**—a patented metal forming machine which bends and shapes sheets, rods; strips tubing into innumerable complex as well as simple forms that would be difficult or even impossible to make by other means. Eliminates need for expensive tools or specialized skills. Height 47", net weight 200 lbs. Write us today for descriptive catalog, prices, etc.

**PERKINS MACHINE & GEAR CO.**  
**WEST SPRINGFIELD, MASSACHUSETTS**

**NONE BETTER... America's First and Safest**

# **HERC-ALLOY**

## **SLING CHAINS**

**STRENGTH**—Size for size, no other sling chain offers a greater tensile strength. HERC-ALLOY will not crystallize—never requires annealing.

**SAFETY**—HERC-ALLOY Sling Chains are made to your specifications. Every new sling carries a written guarantee, is registered and tested before shipping. This registration serial number is carried at the top link.



Identify HERC-ALLOY by the patented Inswell side weld with the extra swell of metal on the inside of the link.



*Write*

for Data Book No. 3 which contains much useful manufacturing and application information on HERC-ALLOY Sling Chains.

**EFFICIENCY**—Lighter, stronger HERC-ALLOY Sling Chains feature the exclusive short, narrow link design which holds firmer, less tendency to kink, less gouging. Workmen handle HERC-ALLOY with less effort.

**PREFERENCE**—Men who buy and use sling chains are influenced only by facts learned through experience. HERC-ALLOY Sling Chain preference has been built up over the years, not just by what we say, but by how HERC-ALLOY performs on the job.

## **COLUMBUS MCKINNON CHAIN CORPORATION**

(Affiliated with Chisholm-Moore Hoist Corp.)

**GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.**

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5th National Handling Exposition

## **Technical Briefs**

drillhead units on the machine. One drills an oil hole while the other drills and countersinks the hole to be tapped in the pan rail. When these units retract after drilling, the fixture is automatically shuttled to the left and locked in position for the next operation.

### **Automatic Transfer**

Then the other drillhead and tapping head automatically begin drilling the other oil hole and tapping the hole in the pan rail simultaneously. As soon as these holes are finished, the drillhead and tapping head retract and the fixture and cylinder block shuttle back to loading position, with the air clamp being released and the locating pins stripped from the block at the same time.

The block is then automatically transferred back onto the roller conveyor and another loaded into the fixture and the cycle repeated.

Operating at an efficiency of 80 pct the machine will handle 55 cylinder blocks per hour with ease. Trial runs have produced excellent results and very little maintenance outside of changing tools has been required.

Standard component parts are used throughout the machine to reduce costs and maintenance expense. Air cylinders, drillheads, motors and switches are all standard items. Boots cover all ways that might be fouled by dirt or chips. A coolant system is provided for the tapping operation.



DRILLING of holes at compound angles, rapid speeds is possible with this transfer type machine developed by Modern Industrial Engineering Co., Detroit.

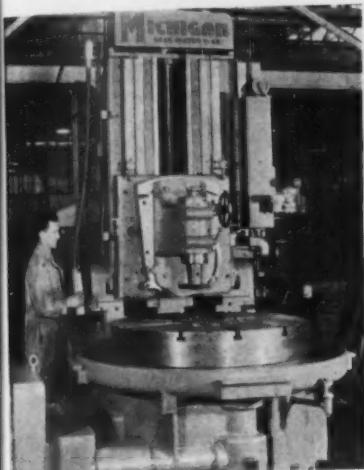
## MACHINING:

Big gear shavers cut machining costs, improve accuracy.

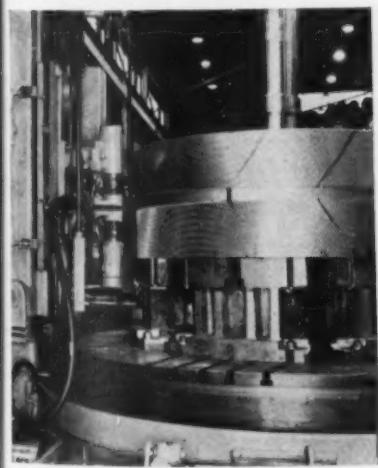
Large gears up to 15 ft in diameter and to 48 in. in face width can be finished faster, to higher accuracies, and at lower costs with newly developed standard vertical large-gear shaving machines.

Developed by Michigan Tool Co., Detroit, the machines can be used for spur, helical, or herringbone gears, internal or external with or without integral shafts. Gears of these types are often used in marine, railroad, power plant, ordnance, and other large gear applications.

The machines are available in 48 in., 72 in., 120 in. and 180 in. gear diameter capacities.



SETUP for shaving internal gears up to 48 in. in diam., 30 in. face width, with or without integral shafts.



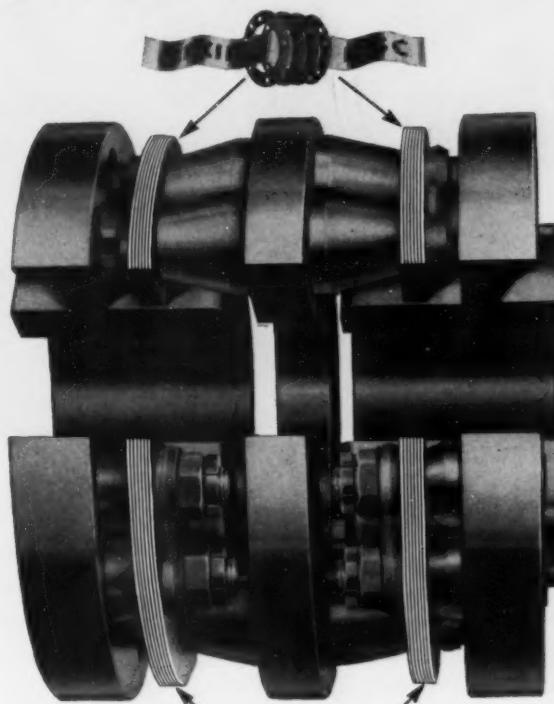
CLOSEUP of large herringbone gear with integral shaft set up on Michigan V-120. Guided cutters are mounted on dual shaving heads. Unit has magnetic chip separator to reduce maintenance costs.

## AVOID COSTLY SHUT-DOWNS!

Specify THOMAS Flexible Couplings for Power Transmission

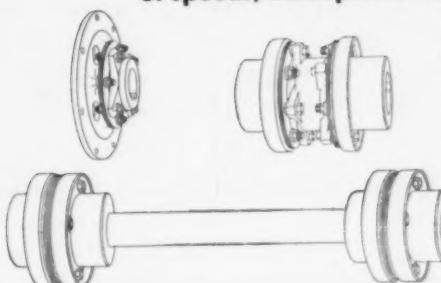
### DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS

FACTS	EXPLANATION
<b>NO MAINTENANCE</b>	Requires No Attention. Visual Inspection While Operating.
<b>NO LUBRICATION</b>	No Wearing Parts. Freedom from Shut-downs.
<b>NO BACKLASH</b>	No Loose Parts. All Parts Solidly Bolted.
<b>CAN NOT "CREATE" THRUST</b>	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
<b>PERMANENT TORSIONAL CHARACTERISTICS</b>	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes.



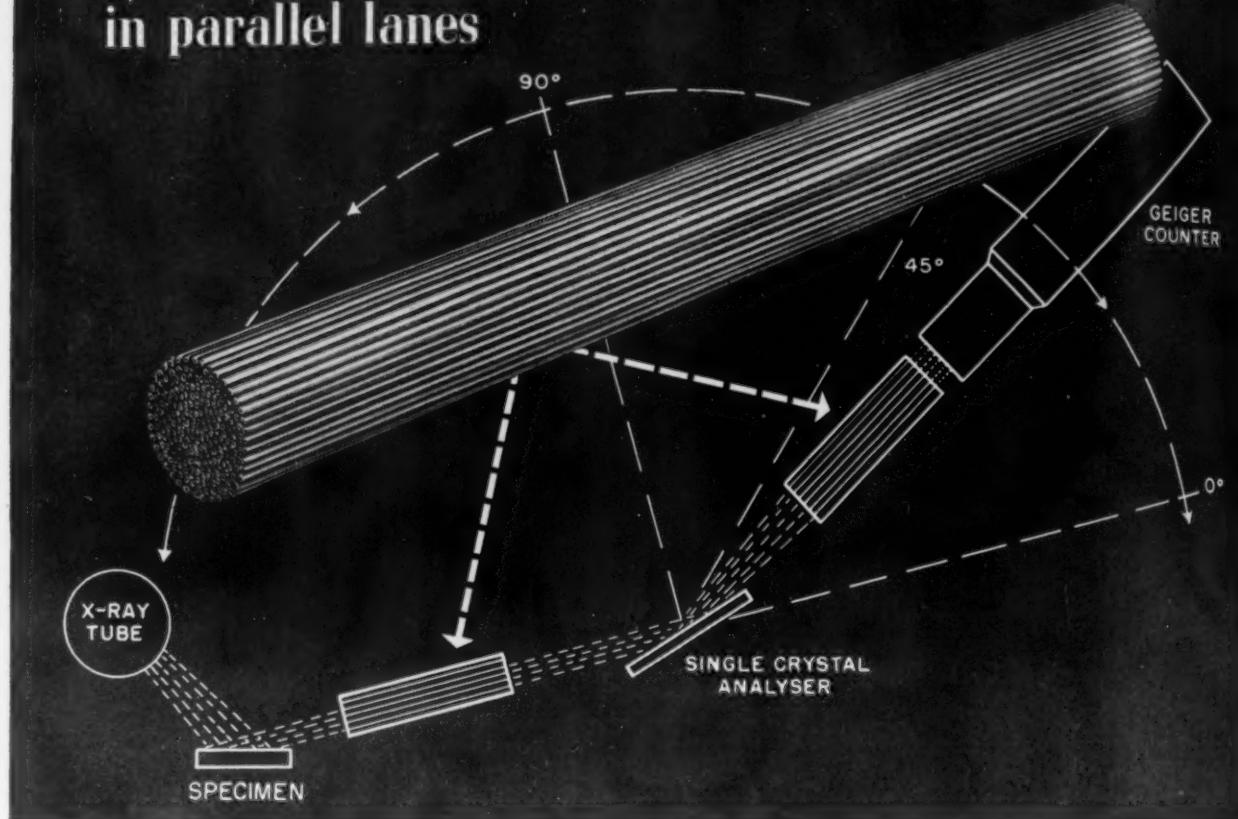
THE THOMAS PRINCIPLE GUARANTEES  
PERFECT BALANCE UNDER ALL  
CONDITIONS OF MISALIGNMENT.

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FLEXIBLE COUPLINGS ONLY  
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**THOMAS FLEXIBLE COUPLING COMPANY**  
WARREN, PENNSYLVANIA, U.S.A.

## The cop who keeps x-ray traffic moving in parallel lanes



Fluorescence analysis is the new, fast way to find out which elements and how much of each are in alloys—without destroying the sample of the alloy.

This trick is accomplished by bombarding the alloy specimen with X-rays using a Fluorescence Analysis Unit produced by North American Philips, Inc. The x-radiations of each element bounce off the specimen only to be separated according to wavelength and measured.

As the x-radiations leave the specimen they shoot through bundles of fine tubes known as "collimators". The collimator acts as a kind of traffic cop, keeps the rays moving in parallel lanes, reduces divergence. This is an interesting

job, and we're pleased that North American Philips chose Superior fine nickel tubing for it on the basis of its uniformity in diameter, wall thickness and finish.

Undoubtedly you have opportunities where tubing could be helpful—as a carrier, a weight-saving structural member, or as a shape that saves machining time. Look into the variety of forms, sizes, and analyses Superior produces to tight specifications. Take advantage of the experience and testing facilities that Superior brings to focus on your problem. Tell us the nature of your application and we'll send you information and a Data Memo by return mail. Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

**Round and Shaped Tubing available in Carbon, Alloy, and Stainless Steels, Nickel Alloys, Beryllium Copper, Titanium and Zirconium.**



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**Superior**  
THE BIG NAME IN SMALL TUBING

All analyses .010" to  $\frac{1}{2}$ " O.D.  
Certain analyses (.035" Max. wall) up to 1 $\frac{1}{2}$ " O.D.

## Extras May Be Raised Before Base Price Increase

**Pressure stronger for price increases . . . But cost of seventh wage round holds key to how much . . . Some extras may be raised before base price increases . . . Scrap prices fall.**

Although major steel price increases are tied to the wage question, there will be some boosts in extra charges before that is settled. Steel extra charges have been under careful scrutiny by some producers for some time. Regardless of what is done about base prices there is strong sentiment for revising extras which are supposed to be based on actual costs resulting from additional work, time, or ingredients in meeting customer specifications.

Republic Steel Corp.'s action in raising extra charges on several types of bars may be considered only the first step in a series of price changes.

Republic's extra increases, which range from \$2.50 to \$5.00 a ton, will be felt most on carbon bars. This is the first price action by a major producer since price controls ended, although at least three other leading steel officials have expressed need for higher prices.

Extra charges, which average about 25 pct of total steel cost to consumers, have not been revised since producers agreed to a hold-the-line price policy at beginning of the Korean War. After complete study, extras may be revised to more realistically reflect actual costs, including changes that arose during the long period of price stabilization. Some producers also feel that base prices of certain products such as bars, structurals, rails, and plates have not been bringing in their share of revenue.

**Back up Predictions . . .** That steel companies are thinking seriously about raising prices was made official last week with statements from three leading producers. Their

statements bolstered an IRON AGE prediction of several weeks ago that steel prices would be raised at least enough to cover any wage increase.

The price increases are expected to come by June, if not sooner. Increases would probably be made now if it were not for uncertainty of the cost of the seventh wage round coming up.

**Plan Wage Campaign . . .** The Wage Policy Committee of United Steelworkers (CIO) meets in Atlantic City, Apr. 27, 28, to fix wage demands and plan strategy. It is taken for granted they will ask a healthy wage increase. And, with the cost-of-living crutch weakening, they will try to support their demands with productivity arguments. Such arguments will be hard to prove—or disprove.

Steelworkers' contract is reopenable on wages only. Notice of desire for wage talks must be given on or before May 1. Following notice, bargaining must begin within 30 days after May 1. If no agreement is reached by midnight June 30, union or company may resort to strike or lockout.

**Not Across the Board . . .** If the steelworkers are finally able to wrangle a moderate wage increase of say 10¢ an hr, the steel price increase will probably average about \$4 to \$5 a ton. It will be higher on some products, lower on others; it will not be across-the-board.

Financial reports of steel companies explain growing pressure for higher prices. Despite high volume production and sales, profits have been falling and profit margins have been shaved paper thin.

**Need Price Hike . . .** Steel leaders are convinced that this trend can not be allowed to continue if their companies are to remain in healthy financial condition. In addition, big outlays for expansion of capacity have left some in need of ready cash.

Two West Coast producers of cold-rolled strip recently raised prices \$5 and \$6 a ton. One of them explained that under its freight absorption policy no provision had been made for freight increases under recently lifted OPS regulations. This producer also raised prices on some alloy products by smaller amounts.

**List Other Increases . . .** Manufacturers of nuts and bolts have also raised prices 2 to 4 pct to cover rising costs. This is in addition to the 2.2 pct increase allowed by OPS shortly before price controls were lifted. At that time fastener makers insisted they needed a bigger price increase to cover higher costs.

Stainless steel prices were recently increased by 2 to 3 pct to cover higher cost of nickel.

The steel market continues strong with consumers paying up to 14¢ per lb (over twice regular mill prices) for sheets from conversion and broker sources. Demand for heavy plates, bars and oil country goods is only a step behind. Demand is easier for galvanized sheets, some wire products, and pig iron.

**Scrap Falls . . .** The scrap market, which had turned soft in recent weeks, took a beating this week. THE IRON AGE Steel Scrap Composite Price fell \$1.75 a ton to \$41.00 per gross ton. Sharp price declines were registered in nearly all areas.

Steelmaking operations this week are scheduled at 99.5 pct of rated capacity, up one point from last week's revised rate.



## "THAT'S OUR STEEL STOCKROOM"

The gentleman is referring to the Carpenter Mill-Branch Warehouse in his locality. Have you ever thought about making your nearest Carpenter Warehouse *your* steel stockroom, too?

When you do, you'll make the profitable discovery that your Carpenter Mill-Branch Warehouse is not only stocked with tool, alloy and stainless steels... but puts at your command one of the most comprehensive services on steel ever devised.

And *every* service is designed to free you from more of your steel problems... lets you concentrate on your one important job of making *more* and *better* products at a lower unit cost.

There's the man on the warehouse order desk ready to give quick information on sizes, prices and grades. There's professional in-the-shop help on tooling and production problems... service literature to help you get the most from every

pound of steel you use... as well as Metallurgical Counsel available to you direct from the Reading Mill.

Give your nearest Carpenter Mill-Branch Warehouse or Distributor a chance to prove how this comprehensive Mill-Branch Warehouse Service can pay off for you. Simply pick up your phone, call the number and be ready for action! The Carpenter Steel Co., 121 West Bern St., Reading, Pa.

# Carpenter STEEL

Mill-Branch Warehouse Service

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## Market Briefs and Bulletins

**Armco Opens New Plant . . .** Production at Armco Steel Corp.'s new \$40 million blast furnace at Middletown, Ohio, started last week. The new furnace is the first to be built in southwestern Ohio in more than 25 years and will produce 1300 tons of pig iron per day. Increased steel demand in the central part of the U. S., not a result of defense demand, was the reason given for the expansion.

**Pig Stays Soft . . .** Although demand for pig iron continues soft, the market shows some signs of improvement. Hard-hit gray iron foundries aren't ordering, but makers of ingot mold and large castings are busy. Main worry of merchant iron producers is failure of plumbing and heating to develop usual spring pickup. Jobbers may be holding back orders in hope of lower prices. Falling east scrap market may influence some founders to use more scrap and less pig in their charges.

**Price Rise . . .** Due to rising costs, nut and bolt manufacturers have increased their prices between 2 to 4 pct, effective April 10. This is in addition to the 2.2 pct allowed by OPS to compensate for higher material costs last October. At that time the industry complained that the allowable increase was not enough in that higher labor and transportation costs were not taken into account.

**Worth More . . .** Due to a typographical error, the new forging press plant being constructed by Aluminum Co. of America in Cuyahoga Heights, Ohio, was described in last week's issue (p. 155) as a \$40,000 plant. This figure should have been \$40 million.

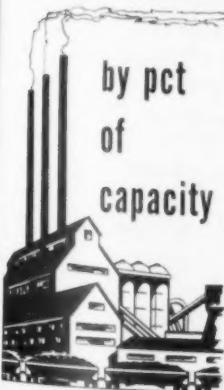
**Order Tinplate . . .** Britain's Metal Box Co., supplier of cans and other metal containers, has ordered \$2.8 million worth of tinplate in addition to its normal monthly purchases. Reason for the special purchase is to keep up production in hand mills currently threatened by a shutdown.

**Kaiser Price Change . . .** Kaiser Steel last week upped prices on cold-rolled strip \$5 a ton with lesser increases on several categories of alloy products. Action covers products previously under price control on which no adjustment was made in another increase a few months ago. Under Kaiser's freight absorption policy, no provision was made under OPS regulations for freight rate increases.

**Make More Air Conditioners . . .** Production of air conditioning units by Airtemp Div. of Chrysler Corp. will be 50 pct greater this year than in 1952. A company spokesman states that shipments in the first quarter of this year were 92 pct above the rate for the same period in 1952, (THE IRON AGE, April 2, 1953, p. 89)

**Use More Boron Steel . . .** Production of boron alloy steel ingots last year was nearly double 1951 production. Preliminary estimate by American Iron & Steel Institute is that more than 700,000 tons of boron steel were produced last year, reflecting efforts to save critical alloys such as chromium, nickel and molybdenum. The Institute also estimates that about 1½ tons of steel products may be required in the structure, furnishing and equipment of a modern kitchen with attached laundry room if steel is widely used.

## STEEL OPERATIONS

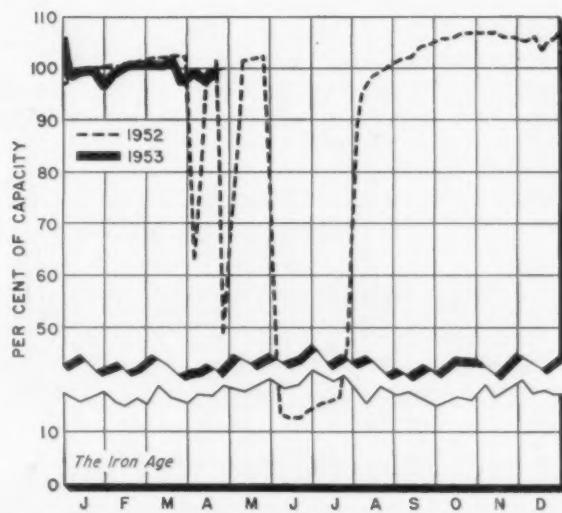


### District Operating Rates

District	Week of Apr. 19	Week of Apr. 12
Pittsburgh	99.0	99.0
Chicago	104.5	105.0
Philadelphia	94.0	94.0
Valley	102.0	89.0*
West	107.0	103.0*
Cleveland	97.0	101.0*
Buffalo	94.0	94.0
Detroit	105.0	103.0
Birmingham (South)	101.0	101.0
Wheeling	101.0	101.0*
South Ohio River	89.5	88.0
St. Louis	86.5	71.0
East	93.5	93.0*
<b>AGGREGATE</b>	<b>99.5</b>	<b>98.5*</b>

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

\* Revised



## Nonferrous Markets

### Copper Market Nears Single Price

Range now 30.00¢ to 30.50¢ for domestic metal . . . Belgian copper cut to 30.00¢ c.i.f. New York . . . Wait action on Chile price . . . Order magnesium output cutback—By R. L. Hatschek.

Copper price fringes are continuing in their settling action toward the 30¢ per lb figure quoted by the major domestic mine producers. Last week the custom smelters eased their quotations off to a top of 30.50¢ with other sales a bit lower.

This action of the custom smelters was precipitated by the reduction in Belgian copper price to 30.00¢ c.i.f. New York. This is equivalent to 30.25¢ per lb delivered Connecticut Valley. Meanwhile, other foreign copper sources were offering metal for future delivery at 28.50¢ and 29.00¢ per lb c.i.f. New York.

**No Rush to Buy . . .** In the light of these happenings buyers are sitting back as much as possible to wait out the market. All want to see where the price will settle before making commitments.

Much interest and speculation is heard on what move the Chileans are likely to make. They are being undersold from all directions but still there is no word on cutting the 36.50¢ price. Purchases have been made at that price for May delivery but the recent strike in Chile will cut May shipments by several thousand tons.

**Cut Scrap Prices . . .** Both custom smelters and ingot makers reduced their scrap buying prices last week. But most of them were out of the market early this week and the outlook was for even lower quotations before the week is over.

Just as we went to press last week, a leading ingot maker cut secondary brass and bronze ingot prices. This move was attributed to skidding scrap prices and nose-diving tin prices. In the 85-5-5-5 group prices are off 2¢ per lb; in the 80-10-10, off 2¢ to 5½¢; in the 88-10-2, off 1½¢ to 6¢; and others are 1¢ to 3½¢ lower.

Shipments of brass and bronze ingots in March reached the highest level in more than a year. Total for the month was 28,256 tons, up nearly 3000 tons from the previous month, according to industry figures.

**Copper Output Higher . . .** statistics of the Copper Institute show an increase to 112,016 tons of copper refined in the U. S. during March as compared to 101,538 tons refined in the short month of February.

Outside the U. S. the increase was from 88,539 tons in February to 104,926 tons in March.

**Loosen Export Quotas . . .** On the Washington front, Office of International Trade last week placed copper refined from foreign ores, concentrates, blister or scrap under open-end quotas.

This means the end of quantitative limits, but exports of these materials are still controlled on the basis of rules for safeguarding national security.

This open-ended quota also applies to refinery shapes where foreign and domestic ores have been mingled, provided an equivalent amount of foreign ore has been smelted to replace the co-mingled copper being exported.

**Would Drop Tariff . . .** U. S. Treasury Dept. is studying a government request for suspension of the existing import duties on aluminum. They now range from 1.5¢ to 3¢ per lb. Request was made by Small Defense Plants Administration which wants to improve supplies for the nation's small fabricators.

Suspension should remain in effect for at least a year, SDPA tells the Treasury. It would apply only to primary and secondary aluminum ingot. In the "severe competition" for materials, the agency says, many small fabricators may be unable to secure adequate supplies.

**Cut Back Magnesium . . .** Government production of magnesium is to be substantially reduced. Defense Dept. ordered the cutback which will probably mean the closing of two or three of the six reactivated government plants.

Production of magnesium from these plants and the plant of Dow Chemical Co. totaled 9078 tons in February, 9908 tons in January and has been running at similar levels since last summer. But total consumption has been only some 4000 tons monthly. Much of this excess output is at a cost of up to double the market value of the metal—a rugged price to pay for stockpiling.

#### NONFERROUS METAL PRICES

(Cents per lb, except as noted)

	Apr. 15	Apr. 16	Apr. 17	Apr. 18	Apr. 20	Apr. 21
Copper, electro, Conn.....	30.00-	30.00-	30.00-	30.00-	30.00-	30.00-
	32.00	30.50	30.50	30.50	30.50	30.50
Copper, Lake, delivered...	33.00	32.25	32.25	32.25	32.25	32.25
Tin, Straits, New York....	95.00	98.00	97.50	....	95.00	95.00*
Zinc, East St. Louis.....	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis.....	12.30	12.30	12.30	12.30	11.80	11.80

Note: Quotations are going prices.  
\*Tentative

# NEW BOOKLET...

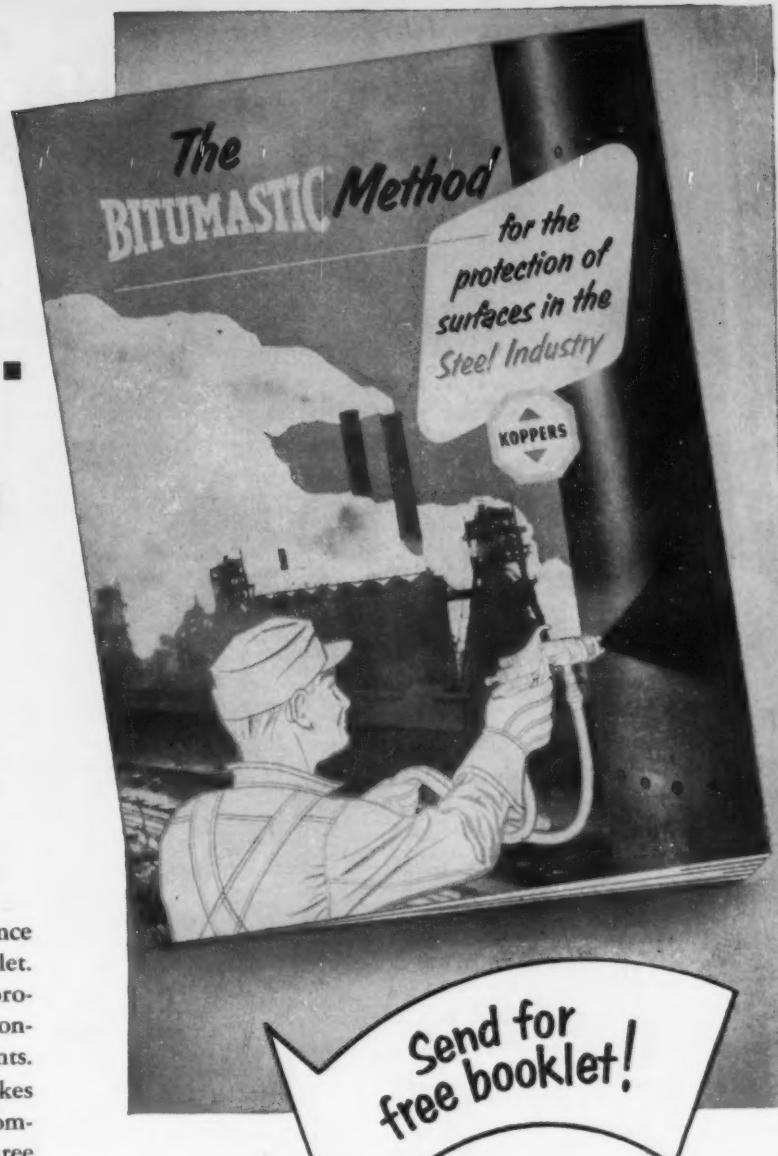
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Steel Industry

... shows how to cut  
maintenance costs!

• Every man interested in plant maintenance programs should have a copy of this new booklet. It describes "The Bitumastic® Method" of protecting surfaces against the severe corrosive conditions found in and around steel and coke plants.

Among other things, this 16-page booklet takes you through the three application steps that comprise "The Bitumastic Method." These three steps, plus Koppers six specially formulated Cold-Applied Coatings, give you lasting protection. The booklet also shows how you can get longer and better protection for vulnerable surfaces, thereby cutting your annual maintenance costs.

This booklet is filled with interesting illustrations and indisputable facts about corrosion prevention. Proof that the careful, thorough way, coupled with the proper protective coatings, is the *only* way to deal with a problem as tough as corrosion. Send for a free copy. Just mail the handy coupon.



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## Nonferrous Prices

(Effective Apr. 21, 1953)

### MILL PRODUCTS

(Cents per lb, unless otherwise noted)

#### Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet:	0.188-in., 28, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 43.6¢; 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 45.7¢; 0.082-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 45.6¢; 75S-O, 75S-OAL, 57.0¢.
Plate, 1/4-in. and Heavier:	2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 33.6¢; 24S-O, 24S-OAL, 35.4¢; 75S-O, 75S-OAL, 42.3¢.
Extruded Solid Shapes:	Shape factors 1 to 5, 36.4¢ to 80.8¢; 12 to 14, 37.1¢ to 97.2¢; 24 to 26, 39.7¢ to \$1.27; 36 to 38, 47.0¢ to \$1.86.
Red, Rolled:	1.064-in. to 4.5-in., 2S-F, 3S-F, 41.0¢ to 36.6¢; cold-finished, 0.375-in. to 3.495-in., 2S-F, 3S-F, 44.2¢ to 38.8¢.
Screw Machine Stock:	Rounds, 11S-TS, 1/4 to 1/82-in., 58.4¢ to 45.9¢; 5% to 1 1/4-in., 46.8¢ to 42.6¢; 1 9/16 to 2-in., 42.0¢ to 39.3¢. Base 5000 lb.
Drawn Wire:	Coiled, 0.051 to 0.374-in., 28, 43.2¢ to 31.7¢; 52S, 52.4¢ to 33.8¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 52.9¢ to 40.5¢.
Extruded Tubing:	Rounds, 63S-TS, OD 1 1/4 to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.8¢; 6 to 9 in., 37.6¢ to 47.5¢.
Roofing Sheet:	Flat, per sheet, 0.019-in., 28 x 72 in., \$1.247; x 96 in., \$1.662; x 120 in., \$2.077; x 144 in., \$2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.8¢.

#### Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, 1/4 in., 66¢; 3/16 in., 68¢; 5/8 in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 77¢; 1/2 to 5/8 in., 60.5¢; 1 1/4 to 1.749 in., 86¢; 2 1/2 to 5 in., 51.5¢. Other alloys higher. Base up to 5 in. diam, 10,000 lb; % to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.8¢; 0.22 to 0.25 lb, 5.8 in., 62.8¢; 0.50 to 0.59 lb, 8.6 in., 69.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD, 1/4 to 5/16 in., \$1.48; 5/16 to 5/8 in., \$1.29; 1/2 to 5/8 in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, % to 5 in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1 1/4 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; over 3 in., 30,000 lb. ASX-679

#### Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

#### Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86 1/2	67 1/2	92 1/2
Strip, CR	92 1/2	70 1/2	98 1/2
Rod, bar	82 1/2	65 1/2	88 1/2
Angles, HR	82 1/2	65 1/2	88 1/2
Plate, HR	84 1/2	66 1/2	90 1/2
Seamless Tube..	115 1/2	100 1/2	137 1/2
Shot, blocks	57		

#### Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Shapes
Copper .....	48.51	46.83	50.58
Copper, h-r ..	50.48	46.83	...
Copper, drawn ..	48.08		
Low brass .....	45.99	45.68	...
Yellow brass .....	42.87	42.56	...
Red brass .....	47.11	46.80	...
Naval brass .....	47.01	41.07	42.33
Leaded brass .....			39.95
Com. bronze .....	48.76	48.45	...
Mang. bronze .....	50.73	44.62	46.18
Phos. bronze .....	70.50	70.75	...
Muntz metal .....	44.91	40.47	41.72
NI silver, 10 pct	56.56	59.83	62.89

### PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed .....	20.50
Aluminum pig .....	19.50
Beryllium copper, per lb cont'd Be \$40.00	
Beryllium aluminum 5% Be, Dollars Per lb contained Be .....	72.75
Bismuth, ton lots .....	2.25
Cadmium, del'd .....	2.00
Cobalt, 97-99% (per lb) .....	\$2.40 to \$2.47
Copper, electro, Conn. Valley .....	30.00 to 30.50
Copper, Lake, delivered .....	32.25
Nickel, U. S. Treas., dollars per oz .....	\$35.00
Indium, 99.8%, dollars per troy oz .....	\$2.25
Iridium, dollars per troy oz .....	\$175 to \$185
Lead, St. Louis .....	11.80
Lead, New York .....	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb .....	27.00
Magnesium, sticks, 100 to 500 lb .....	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York .....	\$195 to \$198
Nickel electro, f.o.b. N. Y. warehouse .....	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel .....	56.25
Palladium, dollars per troy oz .....	\$24.00
Platinum, dollars per troy oz .....	\$90 to \$93
Silver, New York, cents per oz .....	85.25
Tin, New York .....	95.00
Titanium, sponge .....	5.00
Zinc, East St. Louis .....	11.00
Zinc, New York .....	11.83
Zirconium copper, 50 pct .....	36.20

### REMELTED METALS

#### Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.50
No. 120	26.75
No. 123	26.00
80-10-10 ingot	
No. 305	32.00
No. 315	29.75
88-10-2 ingot	
No. 210	40.75
No. 215	37.75
No. 245	32.75
Yellow ingot	
No. 405	22.75
Manganese bronze	27.50

#### Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max .....	24.50-26.00
0.60 copper, max .....	24.25-25.50
Piston alloys (No. 122 type) .....	22.75-24.00
No. 12 alum. (No. 2 grade) .....	22.00-22.50
108 alloy .....	22.75-23.50
195 alloy .....	22.75-24.00
13 alloy (0.60 copper max) .....	24.25-24.75
ASX-679 .....	22.50-23.50

#### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/4%	23.00-26.00
Grade 2—92-95%	22.50-24.50
Grade 3—90-92%	22.00-23.50
Grade 4—85-90%	20.50-23.00

### ELECTROPLATING SUPPLIES

#### Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer .....	45.14
Electrodeposited .....	37.98
Flat rolled .....	45.64
Brass, 80-20	
Cast, oval, 15 in. or longer .....	43.515
Zinc, flat cast .....	20.25
Ball, anodes .....	18.50
Nickel, 99 pct plus	
Cast .....	79.50
Roller, depolarized .....	80.50
Cadmium .....	\$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn. ....	94%

#### Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum .....	63
Copper sulfate, 99.5 crystals, bbl. ....	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed .....	30.00
Nickel chloride, 375 lb drum .....	38.00
Silver cyanide, 100 oz lots, per oz .....	75 1/2
Sodium cyanide, 96 pct domestic 200 lb drums .....	19.25
Zinc cyanide, 100 lb drum .....	47.7

### SCRAP METALS

#### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over.)

Heavy	Turnings
28 1/2	27 1/2
21 1/2	19 1/2
25 1/2	24 1/2
26 1/2	25 1/2
20	19 1/2
22 1/2	21 1/2
21	20 1/2
21 1/2	21 1/2

#### Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire .....	24 1/2
No. 2 copper wire .....	21 1/2-22
Light copper .....	20-21
No. 1 composition .....	19
No. 1 comp. turnings .....	18 1/2-19
Rolled brass .....	18
Brass pipe .....	16 1/2-17
Radiators .....	16 1/2-17

#### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire .....	23 -24
No. 2 heavy copper and wire .....	21 -21 1/2
Light copper .....	19 -19 1/2
New type shell cuttings .....	19 -19 1/2
Auto radiators (unsweated) .....	18
No. 1 composition .....	19
No. 1 composition turnings .....	18 1/2
Unlined red car boxes .....	17 -18
Cocks and faucets .....	16 -16 1/2
Mixed heavy yellow brass .....	13 -13 1/2
Old rolled brass .....	14 -15
Brass pipe .....	17 -17 1/2
New soft brass clippings .....	18 -18 1/2
Brass rod ends .....	17 -17 1/2
No. 1 brass rod turnings .....	16 1/2 -17

#### Aluminum

Alum. pistons and struts .....

8 1/2 -9

Aluminum crankcases .....

9 -10

2S aluminum clippings .....

12 -13

Old sheet and utensils .....

9 -10

Borings and turnings .....

7 1/2 -8

Misc. cast aluminum .....

9 -10

Dural clips (24S) .....

10 -11

#### Zinc

New zinc clippings .....

1 1/2

Old zinc .....

- NON-FERROUS METALS
- ORES AND MINERALS
- METALLIC RESIDUES
- METAL SCRAP
- FERRO ALLOYS

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## Iron and Steel Scrap Markets

### Buying Pace Sluggish, Prices Drop

**No. 1 steel composite drops \$1.75 . . . Reflects general trend of market . . . Scrap at near standstill in some centers . . . Scrap's piling up . . . Mills seen in driver's seat.**

Skid of THE IRON AGE No. 1 steel scrap composite from \$42.75 to \$41.00 pointed a shaky finger at the uneasiness in the scrap market this week. In some areas the scrap flow was at a comparative standstill while in others it was sluggish with mills showing a continuing apathy to buying. The downtrend of prices seemed to take extra momentum.

Consumers continued to work off still-heavy inventories and the spring scrap flow was being dammed up. There was some feeling that a good amount of new orders would lift the price level somewhat but a large recovery was not seen imminent. The summer market for scrap was liable to be drowsy.

Consistently falling secondary scrap grades succeeded in making a few No. 1 heavy melting prices lose ground. Because of the lack of new business and holding up shipments on old orders, prices in some cities had to be pegged on the appraisal basis. The trend was down, scrap men admitted.

Mills were in a strong position to keep the market down. Somewhere along the line scrap was piling up. With the opening of the scrap season a larger volume was in the making.

**Pittsburgh** — Price trend is down. Openhearth grades are off \$1. Summer outlook is bearish. Contributing factors include high inventories and decision by most mills to limit receipts until stocks are reduced, reduced consumption in the district due to shutdown of U. S. Steel's No. 3 openhearth shop at Homestead and increased availability of hot metal for company's other furnaces. One ranking consumer released shipments on a limited basis this week but another large mill's "stop" order is still in effect. Turnings market continues soft, railroad scrap is firm.

**Chicago** — When prices began to fall again last week, it was felt that this

was just the beginning. Turnings were actually moving at the dealer level at as low as \$15 per ton, though one consumer managed to save the market with a purchase. Electric furnace joined railroad grades and steel grades in a downskid and rejections were heavy. Broker buying was generally predicated on the assumption that prices would continue to fall.

**Philadelphia** — A general softness pervaded the local scrap trade early this week. Despite the lack of new business in steelmaking grades, prices are quoted \$1 lower on appraisal of all factors. Further drop is expected. No. 2 bundles are really soft, quoted \$2 lower. Late last week cupola cast sank to \$39 but early this week firmed up to a range of \$41 to \$42, a net drop of \$1. Turnings grades are also lower this week.

**New York** — With scrap practically at a standstill, brokers were quoting gloomy prices that continued the recent downtrend. Mills were still unwilling to buy. Scrap was piling up for collection. Some sources believed fresh orders could pick up prices slightly but the outlook for a large recovery is very dim. Price slips this week extended from steelmaking through turnings. Low phos held after last week's flop. The market is hurting. Pessimism's the keynote.

**Detroit** — Signs of panic can be seen in turnings here. Dealers are moving everything out of their yards in fear of being caught with an inventory in an even lower market. No offers to buy at any price contribute to the uneasy feeling that prevails in the market. Only steelmaking scrap tied to the old formula escapes additional price cuts. The trade here is wondering how long the mills will continue to accept automotive lists at old ceiling.

**Cleveland** — Scrap gloom here this week heightened as most prices slipped downward. No. 1 heavy melting dipped \$2.50 to \$42 and a further decline is expected. Dealers are hoping

the shortage of premium grades will keep the market from hitting bottom. Turnings continued to lose ground as all blast furnace grades were sent down \$3. Rejections on No. 2 steel are numerous.

**Birmingham** — Only moderate quantities of scrap move from the South. Continued declines in prices offered by mills has dealers worried. A buyer just returned from Florida says some yards may be forced to close unless the situation improves. There is no market for some grades of steel in this area at present, particularly No. 1 heavy melting, No. 1 bundles and No. 1 busheling.

**St. Louis** — What little buying of scrap iron during the week was done at sharply lower prices, the break coming during the latter part of the week. Mills have top heavy inventories, and there is so little storage space available that shipments of orders are being spaced.

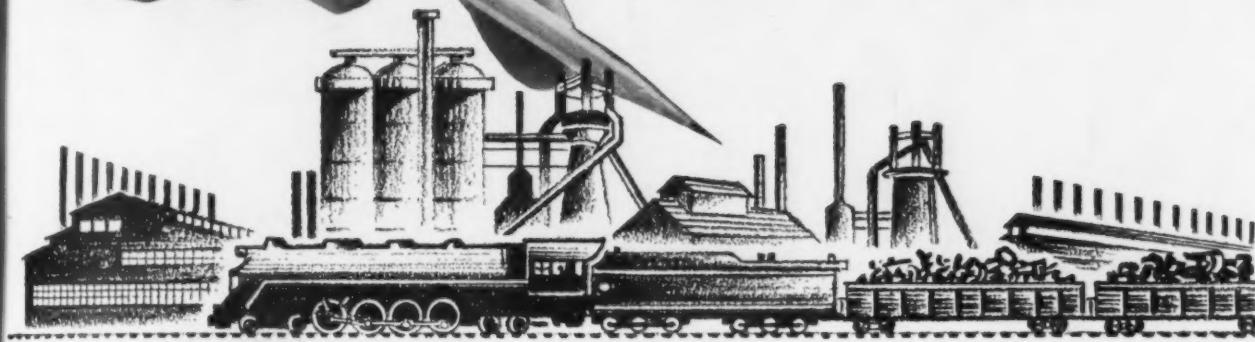
**Cincinnati** — Flow of scrap in Cincinnati is still good but general market weakness has knocked No. 1 heavy melting down \$1.50 to \$44 on appraisal. Secondary grades also felt the effects of the market slowdown, dropping \$2 to \$40. Dealers here say there has been no noticeable increase in rejections.

**Buffalo** — Price declines of \$1 to \$2 a ton have been posted on borings and turnings. Buying interest in these items was light. Bearish sentiment was aggravated by the first water arrival of scrap. About 11,500 tons was received in this district by lake and canal.

**Boston** — Only price change in New England this week is a drop in No. 2 heavy melting steel. Some sales have been as low as \$30 per gross ton, others up to \$32. After dropping for weeks, prices seem more stable. But there's an increase in rejections to make up for it. Cast items remain very weak but prices are unchanged.

**West Coast** — Secondary scrap grades continued to grow weaker in San Francisco and Los Angeles as mills concentrated on top grades for maximum output. In Seattle, however, resumption in buying by an area mill boosted prices \$3 per ton on the top three grades and \$2 ton on No. 2 bundles. Cast prices in San Francisco also rose \$1 at top range.

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## Scrap Prices

(Effective Apr. 21, 1953)

### Pittsburgh

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	28.50 to 29.00
Mixed bor. and ms. turns.	28.50 to 29.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	48.00 to 49.00
Heavy turnings	41.00 to 42.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	48.00 to 49.00
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	54.50 to 55.50
RR. spring steel	54.50 to 55.50
RR. couplers and knuckles	54.50 to 55.50
No. 1 machinery cast.	50.00 to 51.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	41.00 to 42.00
Malleable	48.00 to 49.00

### Chicago

No. 1 hvy. melting	\$37.00 to \$39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 factory bundles	40.00 to 41.00
No. 1 dealers' bundles	38.00 to 40.00
No. 2 dealers' bundles	34.00 to 35.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	50.00 to 51.00
Low phos. punch'gs, plate	42.00 to 44.00
Low phos. 3 ft and under	44.00 to 45.00
No. 1 RR. hvy. melting	43.00 to 45.00
Scrap rails, random lgth.	50.00 to 52.00
Rerolling rails	51.00 to 52.00
Rails 2 ft and under	55.00 to 57.00
Locomotive tires, cut	48.00 to 50.00
Cut bolsters & side frames	49.00 to 50.00
Angles and splice bars	51.00 to 52.00
RR. steel car axles	58.00 to 59.00
RR. couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	41.00 to 43.00
Heavy breakable cast.	36.00 to 37.00
Cast iron brake shoes	38.00 to 39.00
Cast iron car wheels	43.00 to 44.00
Malleable	41.00 to 43.00
Stove plate	38.00 to 39.00

### Philadelphia Area

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	29.00 to 30.00
Mixed bor. short turn.	34.00 to 35.00
Shoveling turnings	35.00 to 36.00
Clean cast chem. borings	41.50 to 42.00
Low phos. 5 ft and under	44.50 to 45.50
Low phos. 2 ft and under	46.00 to 47.00
Low phos. punchings	46.50 to 47.50
Elec. furnace bundles	44.50 to 45.50
Heavy turnings	40.50 to 41.50
RR. steel wheels	51.00 to 52.00
RR. spring steel	51.00 to 52.00
Rails 18 in. and under	58.00 to 59.00
Cupola cast	41.00 to 42.00
Heavy breakable cast	43.50 to 44.50
Cast iron carwheels	47.00 to 48.00
Malleable	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	47.00 to 48.00
Charging box cast	42.00 to 43.00

### Cleveland

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	35.00 to 36.00
No. 1 busheling	41.00 to 42.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. 2 ft and under	47.00 to 48.00
Drop forge flashings	41.00 to 42.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails 3 ft and under	59.00 to 60.00
Rails 18 in. and under	62.00 to 63.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	42.00 to 43.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	45.00 to 46.00
Malleable	50.00 to 51.00

### Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

### Youngstown

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	26.00 to 27.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. plate	49.00 to 50.00

### Buffalo

No. 1 hvy. melting	\$45.50 to \$46.00
No. 2 hvy. melting	41.50 to 42.00
No. 1 bushelings	42.75 to 43.50
No. 1 bundles	42.75 to 43.75
No. 2 bundles	39.50 to 40.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	34.50 to 35.00
Shoveling turnings	35.00 to 35.50
Cast iron borings	36.50 to 37.00
Low phos. plate	48.75 to 49.75
Scrap rails, random lgth.	47.75 to 48.75
Rails 2 ft and under	51.75 to 52.75
RR. steel wheels	50.75 to 51.75
RR. spring steel	50.75 to 51.75
RR. couplers and knuckles	50.75 to 51.75
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast.	42.50 to 43.00

### Detroit

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	34.00 to 34.50
No. 1 bundles, openhearth	40.00 to 41.00
No. 2 bundles	29.00 to 29.50
Heavy turnings	31.00 to 32.00
New busheling	39.00 to 40.00
Drop forge flashings	39.00 to 40.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Electric furnace bundles	42.00 to 43.00
Low phos. punch'gs, plate, heavy	43.50 to 44.50
Low phos. punch'gs, plate, light	41.00 to 42.00
No. 1 cupola cast.	47.00
Heavy breakable cast.	41.00
Stove plate	42.00
Automotive cast	50.00

### St. Louis

No. 1 hvy. melting	\$36.50 to \$37.50
No. 2 hvy. melting	34.50 to 35.50
No. 2 bundled sheets	32.50 to 33.50
Machine shop turn.	23.00 to 24.00
Shoveling turnings	25.00 to 27.00
Cast iron borings	18.00 to 19.00
Rails, random lengths	42.00 to 43.00
Rails 18 in. and under	55.00 to 56.00
Locomotive tires, uncut	47.00 to 48.00
Angles and splice bars	49.00 to 50.00
Std. steel car axles	50.00 to 52.00
RR. spring steel	48.00 to 49.00
Cupola cast	43.00 to 44.00
Hvy. breakable cast.	32.00 to 34.00
Cast iron brake shoes	41.00 to 42.00
Stove plate	38.00 to 39.00
Cast iron car wheels	47.00 to 48.00
Malleable	38.00 to 40.00
Unstripped motor blocks	35.00 to 36.00

### New York

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	31.50 to 32.50
No. 2 bundles	30.00 to 30.50
Low phos. 2 ft and less	39.00 to 40.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	23.50 to 24.00
Clean cast chem. borings	32.00 to 33.00
No. 1 machinery cast.	43.00 to 44.00
Mixed yard cast	37.00
Charging box cast	39.00 to 39.50
Heavy breakable cast.	39.00 to 39.50
Unstripped motor blocks	28.00

### Birmingham

No. 1 hvy. melting	\$35.50 to \$36.50
No. 2 hvy. melting	33.00 to \$34.00
No. 1 bundles	35.50 to 36.50
No. 2 bundles	31.00 to 32.50
No. 1 busheling	35.50 to 36.50
Machine shop turn.	26.00 to 27.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Electric furnace bundles	37.00 to 38.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR. hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	46.00 to 47.00
Rails, 18 in. and under	46.00 to 47.00
Angles & splice bars	46.00 to 47.00
Std. steel axles	46.00 to 47.00
No. 1 cupola cast.	40.00 to 41.00
Stove plate	36.50 to 37.50
Cast iron car wheels	46.00 to 47.00
Charging box cast	30.00 to 31.00
Heavy breakable	30.00 to 31.00
Unstripped motor blocks	24.00 to 25.00
Mashed tin cans	24.00 to 25.00

### Boston

Brokers' Buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.17
No. 2 hvy. melting	\$30.00 to 31.00
No. 1 bundles	34.17
No. 2 bundles	28.25 to 30.00
No. 1 busheling	34.17
Machine shop turn.	29.00
Mixed bor. and short turn.	24.00
Shoveling turnings	24.00
Clean cast chem. borings	21.17
Mixed cupola cast	32.00 to 33.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	30.00 to 31.00
Unstripped motor blocks	28.00

### Cincinnati

No. 1 hvy. melting	\$42.00 to \$44.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	42.00 to 44.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	23.00 to 30.00
Mixed bor. and turn.	23.00 to 30.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. 18 in. & under	49.00 to 50.00
Rails, random lengths	49.00 to 50.00
Rails, 18 in. and under	58.00 to 59.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast	49.00 to 50.00

### San Francisco

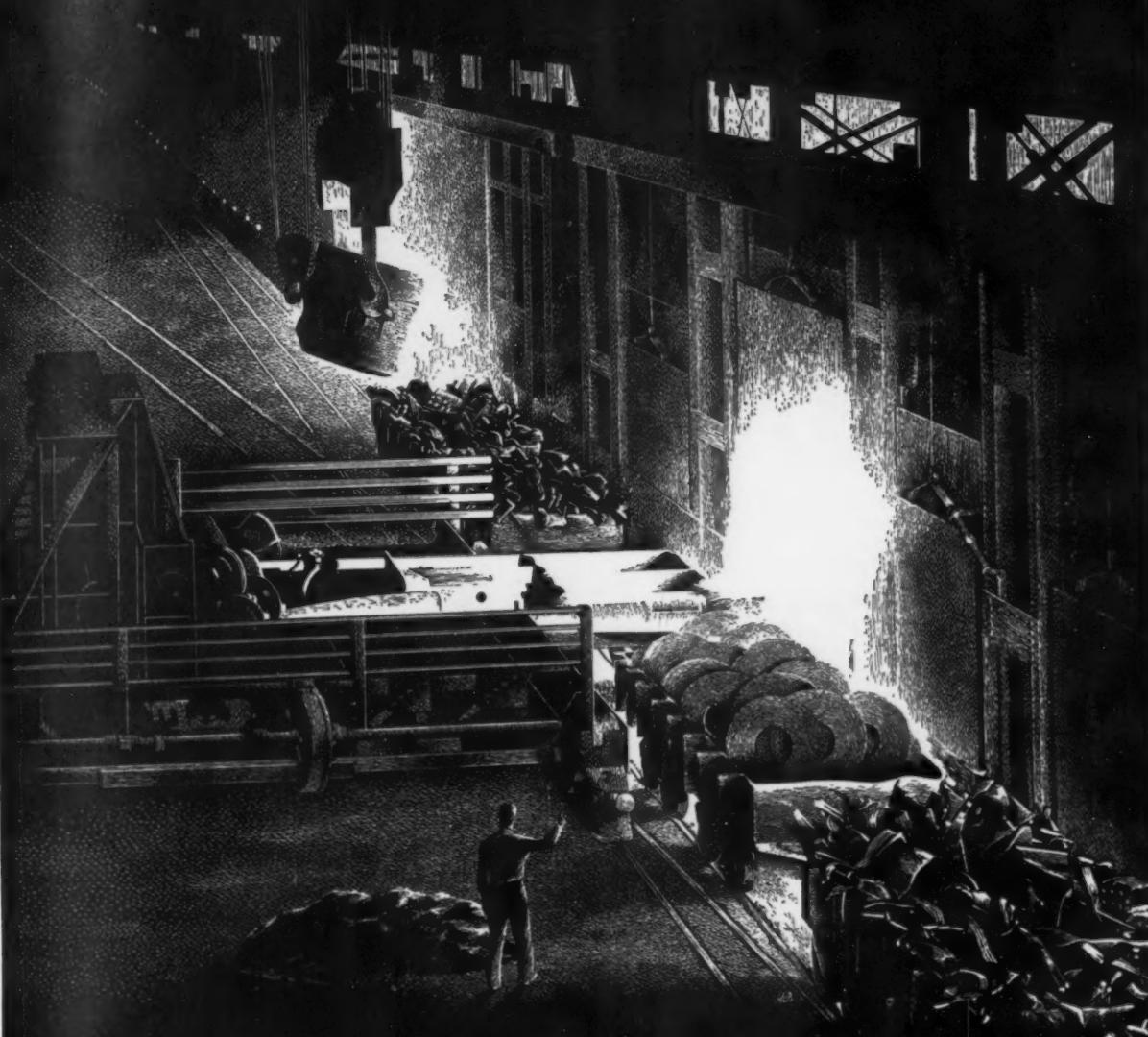
No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	33.00
No. 2 bundles	28.00
No. 3 bundles	30.00
Machine shop turn.	13.00
Cast iron borings	13.00
No. 1 RR. hvy. melting	27.00
No. 1 cupola cast.	\$37.00 to 40.00

### Los Angeles

No. 1 hvy. melting	\$24.00
No. 2 hvy.	

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**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**

## Comparison of Prices

*(Effective Apr. 21, 1953)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Apr. 21 1953	Apr. 14 1953	Mar. 24 1953	Apr. 22 1952
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets .....	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets .....	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga.) .....	5.075	5.075	5.075	4.80
Hot-rolled strip .....	3.725	3.725	3.725	3.50
Cold-rolled strip .....	5.20	5.20	5.20	4.75
Plate .....	3.90	3.90	3.90	3.70
Plates wrought iron .....	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302) ..	36.75†	36.75†	36.75†	36.75
<b>Tin and Tinplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes .....	\$8.95	\$8.95	\$8.95	\$8.70
Tinplate, electro (0.50 lb.) .....	7.65	7.65	7.65	7.40
Special coated mfg. ternes .....	7.75	7.75	7.75	7.50
<b>Bars and shapes: (per pound)</b>				
Merchant bars .....	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars .....	4.925	4.925	4.925	4.55
Alloy bars .....	4.675	4.675	4.675	4.30
Structural shapes .....	3.85	3.85	3.85	3.65
Stainless bars (No. 302) .....	31.50†	31.50†	31.50†	31.50
Wrought iron bars .....	10.05	10.05	10.05	9.50
<b>Wire: (per pound)</b>				
Bright wire .....	5.225¢	5.225¢	5.225¢	4.85¢
<b>Rails: (per 100 lb.)</b>				
Heavy rails .....	\$3.775	\$3.775	\$3.775	\$3.60
Light rails .....	4.25	4.25	4.25	4.00
<b>Semifinished Steel: (per net ton)</b>				
Rerolling billets .....	\$59.00	\$59.00	\$59.00	\$56.00
Slabs, rerolling .....	59.00	59.00	59.00	56.00
Forging billets .....	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs .....	76.00	76.00	76.00	70.00
<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods .....	4.325¢	4.325¢	4.325¢	4.10¢
Skelp .....	3.55	3.55	3.55	3.35

† Add 4.7 pct to base and extras.

### Composite: (per pound)

Finished steel base price .... 4.376¢ 4.376¢ 4.376¢ 4.131¢

	Apr. 21 1953	Apr. 14 1953	Mar. 24 1953	Apr. 21 1953
Pig Iron: (per gross ton)				
Foundry, del'd Phila. ....	\$60.69	\$60.69	\$60.69	\$67.31
Foundry, Valley ....	55.90	55.90	55.90	52.46
Foundry, Southern, Cin'ti ....	58.93	58.93	58.93	55.48
Foundry, Birmingham ....	51.38	51.38	51.38	48.88
Foundry, Chicago ....	55.00	55.00	55.00	52.40
Basic del'd Philadelphia ....	59.77	59.77	59.77	57.00
Basic, Valley furnace ....	54.50	54.50	54.50	57.00
Malleable, Chicago ....	55.00	55.00	55.00	52.50
Malleable, Valley ....	55.00	55.00	55.00	52.50
Ferro-manganese ....	226.25	226.25	226.25	194.33

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy pages.

	Pig iron .....	Scrap: (per gross ton)	Composite: (per gross ton)
No. 1 steel, Pittsburgh ....	\$42.50	\$43.75	\$44.75
No. 1 steel, Phila. area ....	42.50	45.50	44.50
No. 1 steel, Chicago ....	38.00	41.00	43.50
No. 1 bundles, Detroit ....	40.50	40.50	40.50
Low ph., Youngstown ....	49.50	49.50	49.50
No. 1 mach'y cast, Pittsburgh ....	50.50	50.50	52.50
No. 1 mach'y cast, Philadel'a. ....	47.50	47.50	49.00
No. 1 mach'y cast, Chicago ....	45.50	45.50	47.00

\* Basing pt., less broker's fee. † Shipping pt., less broker's fee. Delivered prices, including broker's fee, unless otherwise noted.

Composite: (per gross ton)

No. 1 heavy melting scrap ... \$41.00 \$42.75 \$44.25 \$42.00

Coke, Connellsville: (per net ton at oven)

Furnace coke, prompt .... \$14.75 \$14.75 \$14.75 \$14.75

Foundry coke, prompt .... 17.25 17.25 17.25 17.25

Nonferrous Metals: (cents per pound to large buyers)

Copper, electrolytic, Conn. .... 30.25‡ \$1.00‡ \$0.75‡ \$4.50

Copper, Lake, Conn. .... 32.25 33.00 32.25 24.50

Tin, Straits, New York .... 95.00† 98.50\* \$1.21‡ \$1.21‡

Zinc, East St. Louis .... 11.00 11.00 11.00 18.50

Lead, St. Louis .... 11.80 12.80 13.30 18.80

Aluminum, virgin ingot .... 20.50 20.50 20.50 19.40

Nickel, electrolytic .... 63.08 63.08 63.08 59.50

Magnesium, ingot .... 27.00 27.00 27.00 24.50

Antimony, Laredo, Tex. .... 34.50 34.50 34.50 30.00

\* Tentative. † Average. \* Revised.

## Composite Price Notes

### Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

### Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

### Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1) 500 to 1499 lb, (2) 6000 lb or over, (3) 450 to 1499 lb, (4) 2000 to 3999 lb.

City	Delivery Charge	WARE-HOUSES						Base price, f.o.b., dollars per 100 lb.							
		Sheets		Strip		Plates		Shapes		Bars		Alloy Bars			
		Hot-Rolled	Cold-Rolled (15 ga.)	Galvanized (10 ga.)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 615	A rolled	Hot-Rolled A 6160	Annealed	Cold-Drawn A 615	Cold-Drawn A 6160
Baltimore....	\$20	5.81	7.17	8.04 8.32	6.42	.....	6.05	6.47	6.41	7.18	7.43	.....	.....	.....	
Birmingham....	15	5.80	6.65	7.70 <sup>1</sup>	5.80	.....	6.10	5.95	5.80	7.85	.....	.....	.....	.....	
Boston....	20	6.45	7.35 6.52	8.34 7.71	6.55	8.50 <sup>2</sup>	6.75	6.56	6.42	7.46	10.85	11.15	12.85	13.15	
Buffalo....	20	5.77	6.60	8.31	6.00	.....	6.30	6.05	5.78	6.95	10.70	11.00	12.70	13.40	
Chicago....	20	5.80	6.65	7.90	5.83	.....	5.95	5.95	5.83	6.56	.....	10.65	10.65	12.45	
Cincinnati....	15	6.13	6.72	8.21	6.14	.....	6.47	6.42	6.13	7.16	.....	11.07	11.07	13.07	
Cleveland....	20	5.80	6.65	8.04	6.00	.....	6.12	6.28	5.89	6.66	.....	10.79	10.79	12.79	
Denver....	7.17	8.23	9.60	7.43	8.90	.....	7.37	7.50	7.61	8.24	.....	.....	.....	.....	
Detroit....	28	5.99	6.81	8.59	6.13	7.29	7.54	7.80	7.71	8.48	.....	12.72	12.72	12.82	
Houston....	20	6.35	7.06	8.67	6.70	.....	6.47	6.69	6.47	7.23	.....	11.35	13.00	13.30	
Kansas City....	20	6.47	7.31	8.62	6.51	.....	6.62	6.62	6.50	7.57	.....	11.32	11.32	14.00	
Los Angeles....	20	6.60	8.45	9.50	6.70	9.15	6.70	6.60	6.60	8.35	.....	12.05	12.05	14.00	
Memphis....	10	6.56	7.40	.....	6.98	.....	6.71	6.71	6.59	7.77	.....	.....	.....	.....	
Milwaukee....	20	5.97	6.82	8.07	6.00	.....	6.12	6.12	6.00	6.83	.....	10.82	10.82	12.82	
New Orleans....	15	6.28	7.12	.....	6.32	8.32	6.43	6.43	6.31	7.85	.....	.....	.....	.....	
New York....	30	6.11	7.27	8.07	6.56	8.94	6.60	6.34	6.59	7.46	10.68	10.91	12.67	12.94	
Norfolk....	20	6.62	7.41	8.58	6.72	.....	6.88	6.70	6.79	7.53	10.74	11.04	12.74	13.00	
Philadelphia....	25	6.11	7.13	7.95 8.30	6.45 6.46	.....	6.24	6.17	6.42	7.45	.....	10.67	10.67	12.79	
Pittsburgh....	20	5.80	6.65	7.90	5.94	.....	5.95	5.95	5.83	6.66	.....	10.79	10.79	12.65	
Portland....	20	5.81	6.70	7.60	.....	6.00	.....	6.00	6.00	6.00	.....	.....	.....	12.65	
Salt Lake City....	20	8.30	10.90 <sup>3</sup>	8.45	.....	7.85	8.00	8.40	9.35 <sup>4</sup>	.....	.....	.....	.....	.....	
San Francisco....	15	6.90	8.20	9.50	6.75	9.25	6.75	6.50	6.65	8.40	.....	12.05	12.05	14.00	
Seattle....	20	7.16	8.24	9.20 7.36	7.20	.....	7.04	6.63	6.88	9.37	.....	11.70	11.70	13.70	
St. Louis....	20	6.10	6.94	8.20	6.14	8.27	6.35	6.35	6.13	6.96	10.65	10.95	12.65	13.90	
St. Paul....	15	6.47	7.31	8.61	6.50	.....	6.61	6.61	6.49	7.32	.....	11.31	11.31	13.31	



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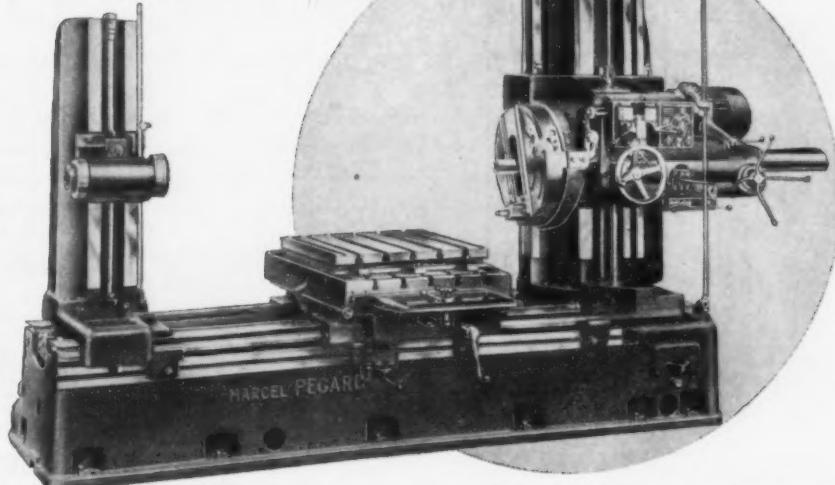
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Spindle traverse	$31\frac{1}{32}''$	$39\frac{1}{32}''$
Spindle speeds	18	18
Facinghead speeds	6	9
Long. traverse of table	$51\frac{3}{16}''$	$63''$
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## IRON AGE

*Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.*

## STEEL PRICES

(Effective  
Apr. 21, 1953)

	INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL- ING	SHAPES STRUCTURALS	STRIP				
	Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton				Sheet Steel	Carbon	Hi Str. Low Alloy	Hot- rolled	Cold- rolled
	EAST												Hi Sp. C.R. Alloy
Bethlehem, Pa.					\$76.00 B3			3.90 B3	5.80 B3				
Buffalo, N.Y.			\$59.00 B3	\$70.50 B3, R3	\$76.00 B3, R3		4.675 B3	3.90 B3	5.80 B3	3.725 B3, R3	5.10 B3	5.70 B3	7.90 B3
Claymont, Del.													
Coatesville, Pa.													
Cessna-Becker, Pa.				\$77.50 A2	\$83.00 A2						4.125 A2		5.30 A2
Harrisburg, Pa.													
Hartford, Conn.													
Johnstown, Pa.			\$59.00 B3	\$70.50 B3	\$76.00 B3			3.90 B3	5.80 B3	3.725 B3			
Newark, N.J.													
New Haven, Conn.													5.60 A5 5.85 D1
Phoenixville, Pa.								4.95 P2					
Putnam, Conn.													
Sparrows Pt., Md.											3.725 B3	5.10 B3	5.70 B3
Worcester, Mass.													
Trenton, N.J.													6.45 R4
Alton, Ill.													4.20 L1
Ashland, Ky.													3.725 A7
Canton-Massillon, Ohio				\$70.50 R3	\$76.00 R3 \$78.60 T5								
Chicago, Sterling, Ill.				\$59.00 U1	\$70.50 U1, R3,W8	\$76.00 U1, R3,W8		4.675 U1	3.85 U1, W8	5.80 U1	3.725 A1,W8 4.725 N4	5.35 A1	
Cleveland, Ohio					\$70.50 R3								5.10 A5,J3
Detroit, Mich.	\$56.00 R5	\$57.00 R5		\$73.50 R5	\$79.00 R5						4.025 G3 4.40 M2	5.30 G3 5.45 M2 5.60 D1 6.05 D2	6.30 G3 8.15 G3
Duluth, Minn.													
Gary, Ind. Harbor, Indiana				\$59.00 U1	\$70.50 U1	\$76.00 U1, Y1		4.675 I3	3.85 I3, U1	5.80 I3, U1,Y1 6.30 Y1	3.725 I3, U1,Y1	5.35 I3	5.65 I1, U1 6.15 Y1
Granite City, Ill.													
Kokomo, Ind.													
Middletown, Ohio													5.10 A7
Niles, Ohio Sharon, Pa.													4.225 SI
Pittsburgh, Pa. Midland, Pa.	\$54.00 U1	\$57.00 U1, C71	\$59.00 U1	\$70.50 U1	\$76.00 U1, C71	3.55 U1 3.65 J3	4.675 U1	3.85 U1,J3	5.80 U1,J3	3.725 A7 3.975 A3 4.225 S7,S9	5.10 J3,A7 5.45 A3 5.80 B4,S7	7.45 J3 8.15 A3	6.30 SI 8.15 SI
Portsmouth, Ohio													
Weirton, Wheeling, Follansbee, W. Va.													4.10 W3
Youngstown, Ohio						\$76.00 Y1, C70	3.55 U1, R3						3.825 W3
Fontana, Cal.	\$81.00 K1	\$83.00 K1	\$78.00 K1	\$89.50 K1	\$95.00 K1				4.50 K1	6.45 K1	5.175 K1	7.00 K1	6.75 K1
Geneva, Utah									3.85 C7	5.80 C7			
Kansas City, Mo.									4.45 S2		4.325 S2		
Los Angeles, Torrance, Cal.									4.45 C7,B2	6.35 B2	4.475 C7,B2	7.15 C1	6.40 B2
Minnequa, Colo.									4.30 C6		4.775 C6		
San Francisco, Niles, Pittsburg, Cal.									4.40 B2 4.56 P9	6.30 B2	4.475 C7,B2		6.40 B2
Seattle, Wash.									4.50 B2	6.40 B2	4.725 B2		6.65 B2
Atlanta, Ga.											4.275 A8		
Fairfield, Ala. Alabama City, Ala.									3.85 T2,R3	5.80 T2	3.725 T2,R3		5.65 T2
Houston, Texas						\$78.50 S2	\$84.00 S2		4.25 S2		4.125 S2		

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

**PRICES**  
*(Effective  
Apr. 21, 1953)*

— 1 —

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES <i>(Effective Apr. 21, 1953)</i>		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing (To Fabricators)	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				4.675 B3	6.00 B3	5.925 B3					
	Buffalo, N. Y.	3.95 B3, R3	3.95 B3, R3	4.975 B5	4.675 B3, R3	6.00 B3, B5	5.925 B3	3.90 B3			5.95 B3	
	Claymont, Del.							4.35 C4			5.35 C4	
	Coatesville, Pa.							4.35 L4			5.75 L4	
	Conshohocken, Pa.							4.35 A2	4.95 A2			6.20 A2
	Harrisburg, Pa.							6.50 C3	6.50 C3			
	Hartford, Conn.			5.475 R3		6.45 R3						
	Johnstown, Pa.	3.95 B3	3.95 B3		4.675 B3		5.925 B3	3.90 B3		5.25 B3	5.95 B3	5.225 B3
	Newark, N. J.			5.375 W10		6.35 W10						
	New Haven, Conn.											
	Camden, N. J.			5.375 P10		6.35 P10						
	Putnam, Conn.			5.475 W10								
	Sparrows Pt., Md.		3.95 B3					3.90 B3		5.25 B3	5.95 B3	5.325 B3
	Worcester, Mass.					6.35 A5						5.525 A5
	Trenton, N. J.											
	Alton, Ill.	4.50 L1										5.45 L1
	Ashland, Ky.							3.90 A7				
MIDDLE WEST	Canton-Massillon	3.95 R3		4.925 R2, R3	4.675 R3 4.72 T5	5.99 T5 6.00 R2, R3						
	Chicago, Ill.	3.95 U, W8, R3 4.55 N4	3.95 R3 4.70 N4	4.925 A5, B5 W8, W10	4.675 R3, U1, W8	6.00 B5, L2, R3, W8, W10 6.05 A5		3.90 U1, W8	4.95 U1	5.25 U1	5.95 U1	5.225 A5, N4, R3 5.325 K2 5.475 W7
	Cleveland, Ohio	3.95 R3	3.95 R3	4.925 A5, C13		6.00 C13 6.05 A5	5.925 R3	3.90 R3, J3	4.95 J3		5.95 R3, J3	5.225 A5, C13, R3
	Detroit, Mich.	4.10 R5 4.30 G3		5.075 R5, P8 5.175 P3	4.825 R5 5.025 G3	6.15 R5, P8 6.20 P3	6.675 G3	4.45 G3			6.30 G3	
	Duluth, Minn.											5.325 A5
	Gary, Ind. Harbor, Crawfordsville, Indiana	3.95 I3, U1, Y1	3.95 I3, U1, Y1	4.925 L2, M3, R3	4.675 I3, U1, Y1	6.00 L2, M5, R3, R5	5.925 I3, U1, 6.425 Y1	3.90 I3, U1, Y1	4.95 I3	5.25 U1	5.95 I3, U1, 6.45 Y1	5.325 M4
	Granite City, Ill.							4.60 G2				
	Kokomo, Ind.											5.325 C9
	Sterling, Ill.		4.80 N4									5.325 N4
	Niles, Ohio Sharon, Pa.							4.15 S1		5.70 S1	5.95 S1	
	Pittsburgh, Pa. Midland, Pa.	3.95 U1, J3	3.95 U1, J3	4.925 A5, J3, W10, R3, C8	4.675 U1, C11	6.00 C8, C11, W10 6.05 A5	5.925 U1, J3	3.90 U1, J3	4.95 U1	5.25 U1	5.95 U1, J3	5.225 A5, J3 5.475 P6
	Portsmouth, Ohio											5.425 P7
	Weirton, Wheeling, Fellowsbee, W. Va.		4.10 W3					3.90 W5 4.20 W3				
	Youngstown, Ohio	3.95 U1, Y1, R3	3.95 U1, Y1, R3	4.925 F2, Y1	4.675 U1, C10, Y1	6.00 C10, F2, Y1	5.925 U1, Y1 6.425 Y1	3.90 U1, Y1, R3			5.95 R3 5.45 Y1	5.225 Y1
WEST	Fontana, Cal.	4.65 K1	4.65 K1		5.725 K1		6.175 K1	4.55 K1		6.30 K1	6.65 K1	
	Geneva, Utah							3.90 C7			5.95 C7	
	Kansas City, Mo.	4.55 S2	4.55 S2		5.275 S2							5.825 S1
	Los Angeles, Terrance, Cal.	4.65 C7, B2	4.65 C7, B2	6.375 R3	5.725 B2		6.625 B2					6.175 C7, B1
	Minnequa, Colo.	4.40 C6	4.75 C6					4.70 C6				5.475 C6
	San Francisco, Niles, Pittsburg, Cal.	4.65 C7, P9 4.70 B2	4.65 C7, P9 4.70 B2				6.675 B2					6.175 C7, C7
	Seattle, Wash.	4.70 B2	4.70 B2				6.675 B2	4.80 B2			6.85 B2	
	Atlanta, Ga.	4.50 A8	4.50 A8									5.475 A8
	Fairfield, Ala. Alabama City, Ala.	3.95 T2, R3	3.95 T2, R3				5.925 T2	3.90 T2, R3			5.95 T2	5.225 T2, R3
	Houston, Texas Ft. Worth, Texas	4.35 S2 5.85 T7	4.35 S2 5.85 T7		5.075 S2			4.30 S2				5.825 S2

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# Steel Prices

(Effective Apr. 21, 1953)

## Key to Steel Producers

With Principal Offices

- Acme Steel Co., Chicago
- Alum Wood Steel Co., Conshohocken, Pa.
- Allegheny Ludlum Steel Corp., Pittsburgh
- American Cast Metals Co., Carnegie, Pa.
- American Steel & Wire Div., Cleveland
- Angell Nail & Chapel Co., Cleveland
- Armenia Steel Corp., Middlefield, O.
- Atlantic Steel Co., Atlanta, Ga.
- Bacock & Wilcox Tube Div., Beaver Falls, Pa.
- Bethlehem Pacific Coast Steel Corp., San Francisco
- Bethlehem Steel Co., Bethlehem, Pa.
- Blair Strip Steel Co., New Castle, Pa.
- Bliss & Laughlin, Inc., Harvey, Ill.
- Calstrip Steel Corp., Los Angeles
- Carpenter Steel Co., Reading, Pa.
- Central Iron & Steel Co., Harrisburg, Pa.
- Claymont Products Dept., Claymont, Del.
- Cold Metal Products Co., Youngstown
- Colorado Fuel & Iron Corp., Denver
- Columbia-Geneva Steel Div., San Francisco
- Columbus Steel & Shafing Co., Pittsburgh
- Continental Steel Corp., Kokomo, Ind.
- Copperweld Steel Co., Glassport, Pa.
- Crucible Steel Co. of America, New York
- Cumberland Steel Co., Cumberland, Md.
- Cuyahoga Steel & Wire Co., Cleveland
- Detroit Steel Corp., Detroit
- Detroit Tube & Steel Div., Detroit
- Driver Harris Co., Harrison, N. J.
- Dickson Weatherproof Nail Co., Evanston, Ill.
- Eaton Stainless Steel Corp., Baltimore
- Empire Steel Co., Mansfield, O.
- Firth Sterling, Inc., McKeesport, Pa.
- Fizzington Steel Corp., Youngstown
- Follansbee Steel Corp., Follansbee, W. Va.
- Globe Iron Co., Jackson, O.
- Granite City Steel Co., Granite City, Ill.
- Great Lakes Steel Corp., Detroit
- Haus Furnace Corp., Detroit
- Ingersoll Steel Div., Chicago
- Inland Steel Co., Chicago
- Interlake Iron Corp., Cleveland
- Jackson Iron & Steel Co., Jackson, O.
- Jewett Steel Corp., Washington, Pa.
- Johns & Laughlin Steel Corp., Pittsburgh
- Joliet Mfg. & Supply Co., Chicago
- Kaiser Steel Corp., Fontana, Cal.
- Keystone Steel & Wire Co., Peoria
- Koppers Co., Granite City, Ill.
- Laclede Steel Co., St. Louis
- La Salle Steel Co., Chicago
- Lone Star Steel Co., Dallas
- Lakeshore Steel Co., Coatesville, Pa.
- Mahoning Valley Steel Co., Niles, O.
- McLouth Steel Corp., Detroit
- Mercer Tube & Mfg. Co., Sharon, Pa.
- Mid-States Steel & Wire Co., Crawfordsville, Ind.
- Monarch Steel Co., Inc., Hammond, Ind.
- Mystic Iron Works, Everett, Mass.
- National Supply Co., Pittsburgh
- National Tube Co., Pittsburgh
- Niles Rolling Mills Co., Niles, O.
- Northwestern Steel & Wire Co., Sterling, Ill.
- Oliver Iron & Steel Co., Pittsburgh
- Papa Steel & Wire Div., Monessen, Pa.
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- Pittsburgh Drawn Steel Div., Plymouth, Mich.
- Pittsburgh Coke & Chemical Co., Pittsburgh
- Pittsburgh Screw & Bolt Co., Pittsburgh

- P6 Pittsburgh Steel Co., Pittsburgh
- P7 Portsmouth Div., Detroit Steel Corp., Detroit
- P8 Plymouth Steel Co., Detroit
- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J.
- R1 Reeves Steel & Mfg. Co., Dover, O.
- R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
- R3 Republic Steel Corp., Cleveland
- R4 Roebling Sons Co. (John A.), Trenton, N. J.
- R5 Rotary Electric Steel Co., Detroit
- S1 Sharon Steel Corp., Sharon, Pa.
- S2 Sheffield Steel Corp., Kansas City
- S3 Shenango Furnace Co., Pittsburgh
- S4 Simonds Saw & Steel Co., Fitchburg, Mass.
- S5 Sloss Sheffield Steel & Iron Co., Birmingham
- S6 Standard Forging Corp., Chicago
- S7 Stanley Works, New Britain, Conn.
- S8 Superior Drawn Steel Co., Monaca, Pa.
- S9 Superior Steel Corp., Carnegie, Pa.
- S10 Sweet's Steel Co., Williamsport, Pa.
- S11 Seidelhuber Steel Rolling Mills, Seattle
- T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
- T2 Tennessee Coal & Iron Div., Fairfield
- T3 Tennessee Products & Chem. Corp., Nashville
- T4 Thomas Strip Div., Warren, O.
- T5 Timken Steel & Tube Div., Canton, O.
- T6 Tremont Nail Co., Wareham, Mass.
- T7 Texas Steel Co., Ft. Worth
- U1 United States Steel Co., Pittsburgh
- U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- W1 Wallingford Steel Co., Wallingford, Conn.
- W2 Washington Steel Corp., Washington, Pa.
- W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa.
- W5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo
- W7 Wilson Steel & Wire Co., Chicago
- W8 Wisconsin Steel Co., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala.
- W10 Wyckoff Steel Co., Pittsburgh
- Y1 Youngstown Sheet & Tube Co., Youngstown

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Casted Nails		Woven Wire Fence 9-15/8 ga.	Fence Posts	Single Loop Bale Ties	Twisted Barbless Wire	Galv. Barbed Wire	March. Wire Ann Id	March. Wire Galv.
	Col	Col							
Alabama City R3	127	135	132	144	6.075	6.325			
Aliquippa, Pa. J3	127	141		148	6.075	6.525			
Atlanta A9	130	140	135	149	6.325	6.675			
Bartonsville K2	127	139	140	148	6.075	6.50			
Buffalo W6									
Chicago N4	127	136	132	145	6.075	6.375			
Cleveland A6									
Cleveland A5									
Crawfordsville M4	127	138	132	147	6.175	6.475			
Donora, Pa. A5	127	133	132	142	6.075	6.225			
Duluth A5	127	133	132	142	6.075	6.225			
Fairfield, Ala. T2	127	133	132	142	6.075	6.225			
Galveston D4	135								
Houston S7	135	147		156	6.475	6.925			
Johnstown, Pa. B3	127	148		149					
Joliet, Ill. A5	127	133	132	142	6.075	6.225			
Kokomo, Ind. C9			142						
Los Angeles B2								7.025	
Kansas City S3	139		144		160	6.075	7.125		
Minnequa C6	132	146	138	137	153	6.325	6.70		
Mobile, Ill. R3			136						
Pittsburg, Cal. C7	146	156	156	162	7.025	7.175			
Monessen P6	127	138		147	6.075	6.45			
Pottersburg P7	132					6.47			
Rankin, Pa. A5	127	133		142	6.075	6.225			
Se. Chicago K3	127	135	140	132	6.075	6.325			
S. San Fran. C6			153		167	7.025	7.40		
Sparrows Pt. B3	129		134	151					6.675
Struthers, O. V1								6.075	6.475
Terrance, Cal. C7	147							7.025	
Worcester A5		133							6.375
Williamsport, Pa. S10									

Cat Nails, carloads base \$7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa. (42) Wheeling, W. Va. (W5) \$7.80.

Zinc extra not included on Galv. Merch. Wire.

Struthers Galv. Merch. Wire based on 15¢ Zinc.

## STAINLESS STEELS

Base price, cents per lb., f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	15.50	16.50	18.00	17.50	26.75	21.75	23.50	13.50	16.25	13.75
Slabs, billets, rerolling	19.75	21.75	23.75	22.75	34.75	28.25	30.75	17.50	21.50	17.75
Forg. discs, die blocks, rings	36.75	37.00	39.75	38.50	57.25	43.50	48.25	30.00	30.50	30.50
Billets, forging	28.25	28.50	30.75	29.75	44.75	33.75	37.75	23.00	23.50	23.50
Bars, wires, structural	33.75	34.00	36.50	35.50	53.00	40.00	44.75	27.50	28.00	28.00
Plates	35.75	35.75	38.00	38.00	56.00	44.00	49.00	28.75	29.75	29.25
Sheets	44.25	44.50	46.50	46.50	61.50	53.00	58.00	39.00	39.50	41.50
Strip, hot-rolled	28.50	30.50	35.00	32.75	52.50	40.00	44.50	25.00	32.75	25.75
Strip, cold-rolled	36.50	39.75	43.50	41.75	63.50	52.00	56.50	32.75	39.50	33.25

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa. CII; Brackenridge, Pa. A3; Butler, Pa. A7; McKeesport, Pa. U1; Washington, Pa. W2; (type 316 add 4.5¢) J2; Baltimore, E1; Middletown, O. A7; Massillon, O. R3; Gary, U1; Bridgeville, Pa. U2; New Castle, Ind. I2; Ft. Wayne, J4; Lockport, N. Y. R4.

Strip: Midland, Pa. CII; Cleveland, A5; Carnegie, Pa. S9; McKeesport, Pa. F1; Reading, Pa. C2; Washington, Pa. W2 (type 316 add 4.5¢); W. L. Leechburg, Pa. U2; Bridgeville, Pa. U2; Detroit, M2; Canton-Massillon, O. R3; Middletown, O. A7; Harrison, N. J. D3; Youngstown, C5; Lockport, N. Y. S4; Sharon, Pa. S1 (type 301 add 3¢); Butler, Pa. A7; Wallingford, Conn. W1.

Bars: Baltimore, A7; Duquesne, Pa. U1; Munhall, Pa. U1; Reading, Pa. C2; Titusville, Pa. U2; Washington, Pa. J2; McKeesport, Pa. U1; F1; Bridgeville, Pa. U2; Dunkirk, N. Y. A3; Massillon, O. R3; Chicago, U1; Syracuse, N. Y. CII; Watervliet, N. Y. A3; Waukegan, A5; Lockport, N. Y. S4; Canton, O. T3; Ft. Wayne, J4.

Wires: Waukegan, A5; Massillon, O. R3; McKeesport, Pa. F1; Ft. Wayne, J4; Harrison, N. J. D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, CII; Bridgeville, U2.

Structures: Baltimore, A7; Massillon, O. R3; Chicago, Ill. J4; Watervliet, N. Y. A3; Syracuse, CII.

Plates: Brackenridge, Pa. A3; Butler, Pa. A7; Chicago, U1; Munhall, Pa. U1; Midland, Pa. CII; New Castle, Ind. J2; Lockport, N. Y. S4; Middletown, A7; Washington, Pa. J2; Cleveland, Massillon, O. R3.

Forged discs, die blocks, rings: Pittsburgh, CII; Syracuse, CII; Ferndale, Mich. A3; Washington, Pa. J2.

Forging billets: Midland, Pa. CII; Baltimore, A7; Washington, Pa. J2; McKeesport, F1; Massillon, Canton, O. R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, CII.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

## Miscellaneous Prices

(Effective Apr. 21, 1953)

### PIPE AND TUBING

Base discounts f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS								
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2-3 In.		3 1/2-4 In.		
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	
STANDARD T. & C.																					
Sparrows Pt. B3	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25							
Youngstown R3	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25							
Fontana K1	19.5	+2.75	22.5	1.25	25.0	4.75	25.5	5.25	26.0	6.25	26.5	6.75	27.0	7.25							
Pittsburgh J3	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	28.0	7.75	
Alton, Ill. L1	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25							
Sharon M3	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25							
Pittsburgh N1	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0		27.0		29.0		
Wheeling W5	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	18.75							
Wheatland W4	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75							
Youngstown Y1	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	7.75	
Indiana Harbor Y1	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25							
Lorain N2	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	7.75	
EXTRA STRONG PLAIN ENDS																					
Sparrows Pt. B3	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5							
Youngstown R3	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5							
Fontana K1	19.25		23.25		25.25		25.75		26.25		26.75		27.25								
Pittsburgh J3	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0	
Alton, Ill. L1	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5							
Sharon M3	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5							
Pittsburgh N1	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75		27.75		31.25		
Wheeling W5	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5							
Wheatland W4	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0							
Youngstown Y1	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0	
Indiana Harbor Y1	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5							
Lorain N2	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0	

Galvanized discounts based on zinc, at 17¢ per lb., East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/2 pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.5¢ to 17.5¢ per lb., use 17¢. Jones & Laughlin discounts apply only when zinc price changes 5¢. Threads only butt-weld and seamless, 1 pt. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 3/4 pt. higher discount. Butt-weld jobbers' discount, 5 pt. St. Louis zinc price now 11.0¢.

### COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.50 to \$15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.50 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedenia, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	22.50
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

### ELECTRICAL SHEETS

22 Ga. H-R cut length	Amature	Elec.	Dynamo	Transf. 72	Transf. 65	Transf. 58
F.o.b. Mill Cents Per Lb.						
	OD-In.	B.W. Ga.	H.R. C.D.	H.R. C.B.		
Beach Bottom W5	7.85	9.10	9.90	10.45	11.00	11.70
Brackenridge A5	7.35	7.85	9.10	9.90	10.45	11.00
Granite City G2	8.55	9.80				
Ind. Harbor J3	7.35	7.85	9.10			
Mansfield E2	7.35	7.85	9.10	9.90		
Niles, O. N. 3	7.35	7.85				
Vandergrift U1	7.35	7.85	9.10	9.90	10.45	11.00
Warren, O. R. 3	7.35	7.85	9.10			
Zanesville A7	7.35	7.85	9.10	9.90	10.45	11.00

### CAST IRON WATER PIPE

6 to 24-in., del'd Chicago	\$110.30	to \$112.80
6 to 24-in., del'd N.Y.	112.50	to \$114.80
6 to 24-in., Birmingham	96.50	to 101.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments		
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.		

### BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless	Elec. Weld
	OD-In.	B.W. Ga.	H.R. C.D.	H.R. C.B.
Babcock & Wilcox..	2	13	23.93	28.14
	2 1/2	12	32.17	37.83
	2	12	35.78	41.22
	3 1/2	11	44.72	52.65
	4	10	55.52	65.31
National Tube...	2	13	22.81	27.94
	2 1/2	12	31.28	38.31
	3	12	35.87	43.93
	3 1/2	11	42.56	52.12
	4	10	54.02	66.16
Pittsburgh Steel...	2	13		28.58
	2 1/2	12	32.16	36.19
	3	12	36.87	44.93
	3 1/2	11	43.76	53.32
	4	10	57.68	

### C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT			
	0.26	0.41	0.61	0.81
Bridgeman, Conn. *S7	5.80	7.65	8.25	10.20
Carnegie, Pa. S9		7.65	8.25	10.20
Cleveland A5	5.10	7.30	8.25	10.20
Detroit D1	6.45	7.50	8.10	10.20
New Castle, Pa. B4	5.80	7.65	8.25	10.20
New Haven, Conn. D1	6.70	7.60	8.20	
Sharon, Pa. S1	5.80	7.65	8.25	10.20
Trenton, N. J. R4	7.95	8.55	10.50	12.50
Warren, Ohio T4	6.20	7.65	8.25	10.20
Weirton, W. Va. W3	5.80	7.65	8.25	10.20
Worcester, Mass. A5	5.40	7.60	8.55	10.50
Youngstown C5	7.65	8.25	10.20	12.50

\* Sold on Pittsburgh base.

**Miscellaneous Prices—**  
(Effective Apr. 31, 1953)

**RAILS, TRACK SUPPLIES**

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rule	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U.I.	3.775	4.25	4.925	6.65	—	—	—
Chicago R.I.	—	—	—	—	—	—	—
Dleveland R.I.	3.775	4.25	—	6.65	4.775	—	—
Easley T.I.	—	—	—	4.25	—	—	—
Fairfield T.I.	3.775	4.25	—	6.65	4.775	—	—
Gary U.I.	3.775	4.25	—	6.65	4.775	—	—
Ind. Harbor I.I.	3.775	4.25	4.925	6.65	4.775	—	—
Jackson B.I.	—	—	—	—	—	—	—
Kinston U.I.	—	—	—	4.25	4.925	—	—
Kansas City S.I.	—	—	—	—	—	—	—
Lackawanna B.I.	3.775	4.25	4.925	—	4.775	—	—
Lakeview B.I.	—	—	—	—	6.65	—	—
Minneapolis C.I.	3.775	4.75	4.925	6.65	4.775	9.85	—
Pittsburgh R.I.	—	—	—	—	—	—	—
Pittsburgh O.I.	—	—	—	—	—	—	—
Pittsburgh P.I.	—	—	—	—	—	—	—
Pittsburgh B.I.	—	—	—	—	6.65	—	—
Pitt. Cal. C.I.	—	—	—	—	—	4.925	—
Seattle B.I.	—	—	—	—	7.15	4.925	—
St. Louis B.I.	3.775	—	4.925	—	6.65	4.775	—
St. Louis V.I.	—	—	—	—	—	—	—
Terrace C.I.	—	—	—	—	—	4.925	—
Youngstown R.I.	—	—	—	—	6.65	—	—

**TOOL STEEL**

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
12	4	1	—	—	\$1.505
18	4	1	—	5	\$2.13
18	4	2	—	—	\$1.65
18	4	1.5	8	—	31.0¢
1.5	4	2	6	—	96.5¢
6	4	2	6	—	63.5¢
High-carbon chromium	—	—	—	—	35¢
Oil hardened manganese	—	—	—	—	32.5¢
Special carbon	—	—	—	—	27¢
Extra carbon	—	—	—	—	23¢
Regular carbon	—	—	—	—	—
Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.	—	—	—	—	—

**CLAD STEEL**

Add 4.7 pct to base and extras.

Stainless-carbon No. 304, 20 pct.	Plate	Sheet
Cotesville, Pa. L4	*29.5	
Washington, Pa. J2	*29.5	
Claymont, Del. C4	*29.50	
Conshohocken, Pa. A2		*27.50
New Castle, Ind. I2	*29.77	*26.74
Nickel-carbon		
10 pct Cotesville, Pa. L4	32.5	
Inconel-carbon		
10 pct Cotesville, Pa. L4	40.5	
Mangan.-carbon		
10 pct Cotesville, Pa. L4	33.5	
No. 302 Stainless copper stainless, Carnegie, Pa. A4	77.00	
Aluminized steel sheets, hot dip, Butler, Pa., A7	7.75	
* Includes annealing and pickling, or sandblasting.		

**ELECTRODES**

Cents per lb., f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in. in.	Length in. in.	Cents Per lb.
GRAPHITE		
24	84	18.70
17, 18, 20	60, 72	18.70
8 to 16	48, 60, 72	18.70
7	48, 60	20.50
6	48, 60	21.95
4, 5	40	22.53
3	40	23.68
2 1/2	24, 30	24.26
2	24, 30	26.57
CARBON		
40	100, 110	8.45
35	65, 110	8.45
30	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
14	60, 72	8.45
10, 12	60	9.02
8	60	9.30
	60	9.58

**FLUORSPAR**

Washed gravel, f.o.b., Rosiclare, Ill. Price, net ton; Effective CaF<sub>2</sub> content:  
70% or more ..... \$43.00  
60% or less ..... 40.00



Two 75-ton Bedford Overhead Travelling Cranes at new Northwestern Steel and Wire Co. plant, Sterling, Ill., tend 150-ton tap-charging electric furnaces.

Both 75-ton Bedfords at Northwestern are equipped with 10-ton auxiliary hoists . . . have ample overload capacity. Operators in air conditioned cabs have constant, precise control of these smooth-operating workhorses.

In steel mills, where material handling jobs are tough, more and more production men have compared . . . and chosen Bedford. Today, the list of steelmakers using Bedford overhead cranes is a "bluebook" of the industry. And there's a reason . . .

A half century of specialized experience—designing and building heavy duty precision-engineered overhead cranes for every type of application—assures Bedford's ability to

meet your specific requirements.

Bedford Overhead Electric Cranes are available in all types and sizes . . . from 5 tons to 350 tons, and up . . . for all kinds of indoor and outdoor service. Consult a Bedford engineer before you choose . . . and make your next crane a Bedford.

(Write for complete catalog describing Bedford Cranes in detail.)



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**BEDFORD**

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**ARMSTRONG** Lathe Dogs give extra service because they are drop forged from selected open hearth steel, and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head or safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

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FOR THOSE FASTENERS YOU NEED  
THAT **MUST BE RIGHT** —

SPECIFY

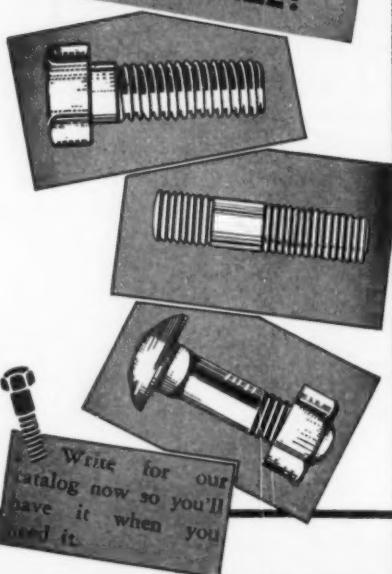
**JAQUES** ALUMINUM, BRASS AND BRONZE!

When high standards dictate the fastening of aluminum with aluminum, JAQUES nuts, bolts, screws, etc., are the answer. Cold-headed and heat-treated, JAQUES aluminum fasteners are light, strong, and durable.

All non-ferrous metals and alloys, including naval brass, silicon bronze and monel, can be furnished in standard and special parts.

**JAQUES Company**

698 BATTERY MARCH STREET, BOSTON, MASSACHUSETTS



## Miscellaneous Prices

(Effective Apr. 21, 1953)

### BOLTS, NUTS, RIVETS, SCREWS

#### Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh,  
Cleveland, Birmingham or Chicago)

#### Nuts, Hot Pressed, Cold Punched—Square

	Pot Off List	Less Keg Reg.	Less Keg Reg.	Hvy.
1/4 in. & smaller	10	24	10	24
9/16 in. & 5/8 in.	8	21	1	16
5/8 in. to 1 1/2 in.				
Inclusive . . . . .	4	18	+4	12
1 1/8 in. & larger	2	17	+4	12

#### Nuts, Hot Pressed—Hexagon

1/4 in. & smaller	22	33	18	30
9/16 in. & 5/8 in.	12	25	1	18
5/8 in. to 1 1/2 in.				
Inclusive . . . . .	8	21	+3	11
1 1/8 in. & larger	4	18	+3	11

#### Nuts, Cold Punched—Hexagon

1/4 in. & smaller	22	33	18	30
9/16 in. & 5/8 in.	19	31	18	26
5/8 in. to 1 1/2 in.				
Inclusive . . . . .	15	27	8	21
1 1/8 in. & larger	2	17	+4	12

#### Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.	
1/4 in. & smaller	33	43	26
9/16 in. & 5/8 in.	27	38	19
5/8 in. to 1 1/2 in.			
Inclusive . . . . .	21	33	11
1 1/8 in. & larger	5	19	net
			Light
7/16 in. & smaller	35	45	
1/2 in. thru 5/8 in.	28 1/2	39 1/2	
5/8 in. to 1 1/2 in.			
Inclusive . . . . .	26	37	

#### Stove Bolts

	Pot Off List
Packaged, steel, plain finished	44 1/2-10
Packaged, plain finish	25 1/2-10
Bulk, plain finish**	59*

\*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter. 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

\*\*inc. Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

#### Rivets

	Base per 100 lb
1/4 in. & larger . . . . .	\$1.00
7/16 in. and smaller . . . . .	Pot Off List

#### Cap and Set Screws

	Pot Off List
Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright	40
5/8 in. thru 1 in. up to & including 6 in.	28
1/4 in. thru 5/8 in. x 3 in. & shorter	33
1/4 in. high C double heat treat	42
5/8 in. thru 1 in. up to & including 6 in.	33
Milled studs	17
Flat head cap screws, listed sizes	12
Fillister head cap, listed sizes	12
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	12

#### Machine and Carriage Bolts

	Pot Off List	Less Case	Case C
1/2 in. & smaller x 6 in. & shorter	11	25	
9/16 in. & 5/8 in. x 6 in. & shorter	15	27	
5/8 in. & larger x 6 in. & shorter	14	26	
All diam. longer than 6 in.	8	22	
Lag, all diam. x 6 in. & shorter	19	31	
Lag, all diam. longer than 6 in.	16	28	
Plow bolts . . . . .	30		

## Miscellaneous Prices —

(Effective Apr. 21, 1953)

### REFRACTORIES

	Carloads, per 1000
Fire Clay Brick	Fift quality, Ill., Ky., Md., Mo., Ohio, Pa.
Fift quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.25)	\$99.30
No. 1 Ohio	92.40
Sec. quality, Pa., Md., Ky., Mo., Ill.	92.40
No. 2 Ohio	83.15
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.60)	14.40

	\$
Silica Brick	Mt. Union, Pa., Ensley, Ala.
	\$99.30
Childs, Pa.	103.95
Hays, Pa.	105.10
Chicago District	122.40
Western Utah	116.55
California	122.85
Super Duty, Hays, Pa., Athens, Tex., Chicago	116.65
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	17.30
Silica cement, net ton, bulk, Hayes, Pa.	19.60
Silica cement, net ton, bulk, Ensley, Ala.	18.45
Silica cement, net ton, bulk, Chicago District	18.45
Silica cement, net ton, bulk, Utah and Calif.	25.95

	Per net ton
Chrome Brick	Standard chemically bonded Balt.
Chester	\$86.00
Burned, Balt., Chester	80.00

	\$
Magnesite Brick	Standard Baltimore
Chemically bonded, Baltimore	97.50

	St. % -in. grains
Grain Magnesite	Domestic, f.o.b. Baltimore
	in bulk fines removed
	\$64.40
Domestic, f.o.b. Chewalah, Wash.,	in bulk
	38.00
	in sacks
	43.70

	\$
Dead Burned Dolomite	F.O.B. producing points in Pennsylvania, West Virginia, and Ohio
	per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢
	\$13.75

### LAKE SUPERIOR ORES

	51.50% Fe; natural content, delivered lower Lake ports. Prices through June 30, 1953, delivery.
	Gross Ton

Openhearth lump	\$10.95
Old range, bessemer	10.10
Old range, nonbessemer	9.95
Mesable, bessemer	9.85
Mesable, nonbessemer	9.70
High phosphorus	9.70

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on Dec. 31, 1952. Increases or decreases after such date are for buyer's account.

### METAL POWDERS

	Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.
Swedish sponge iron c.i.f.	10.9¢
New York, ocean bags.	10.9¢
Canadian sponge iron, del's.	12.0¢
Domestic sponge iron, 98+%	Fe, carloads lots

Electrolytic iron, annealed,	99.5+%
Electrolytic iron, unannealed,	minus 325 mesh, 99+%
	Fe
Hydrogen reduced iron, mi-	60.0¢
nus 300 mesh, 98+%	Fe
Carbonyl iron, size 5 to 10	53.0¢ to 80.0¢
mieron, 98%, 99.8+%	Fe
Aluminum	83.0¢ to \$1.48
Brass, 10 ton lots	31.5¢
	30.00¢ to 33.25¢
Copper, electrolytic, 10.75¢ plus metal value	
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99%	
Lead	min. and quantity, del'd.

Manganese	7.5¢ to 12.0¢ plus metal value
Molybdenum, 99%	57.0¢
Nickel, unannealed	52.75
Nickel, annealed	88.0¢
Nickel, spherical, unannealed	95.0¢
Solder powder	33.5¢
Stainless steel, 302	7.0¢ to 9.0¢ plus met. value
Tin	83.9¢
Tungsten, 99% (65 mesh)	\$5.50
Zinc, 10 ton lots	23.0¢ to 30.5¢

To reduce handling costs and improve production, a fast, efficient 5-ton "Reading" electric crane replaced the slow-moving hoist formerly installed in the plant pictured here. This "Reading" double I-beam, floor-operated crane has a traveling speed of 150 feet per minute—and a 22' lift.

Used to lower heavy domes on their heat treating furnaces, the new crane turns a tedious, costly handling job into a swift "push-button" operation. Worker fatigue is lessened. Shutdown time is reduced. Load handling costs are cut to the bone.

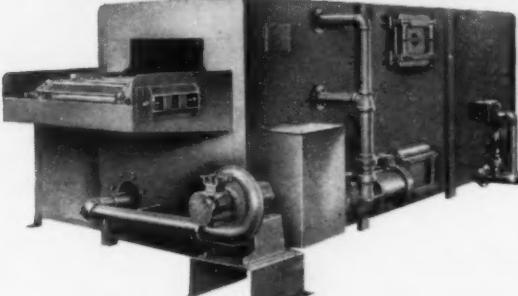
Find out how "Reading" Electric Cranes are "job tailored" to fit your requirements at no extra cost. Write for our latest 16-page bulletin, "The Why and How of Faster Production".

READING CRANE & HOIST CORP. • 2101 ADAMS STREET, READING, PA.

## READING CRANES



For a discussion of latest metal parts and products cleaning methods, write today!



WHEN a washing machine is needed to perform an unusual operation, it's almost certain that A-F Engineers will be called upon to build it! . . . The A-F Washing Machine shown here was built especially for removing sand from steel foundry flasks. A

special feature is the Slo-Flo Tank (not shown in photograph) which settles the sand out of the cleaning solution before it reaches the screening tank for recirculation. Flasks are cleaned faster . . . and each flask is uniformly clean!

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COMPANY**

CHATTANOOGA 2, TENN.

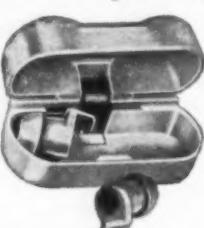
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keep harmful noises out!

If your workers "can't hear themselves think," chances are you'll hear about it in lowered production and damaged hearing.

Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversations.

M.S.A. Ear Defender design insures comfortable fit; complete closure of ear canal; easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.



**Mine Safety Appliances Co.**  
Braddock, Thomas & Meade Sts.  
Pittsburgh 8, Pa.



**Ferroalloy Prices**

(Effective Apr. 21, 1953)

**Ferrocchrome**

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)
0.06% C . . . . . 34.50 0.20% C . . . . . 33.50
0.10% C . . . . . 34.00 0.50% C . . . . . 33.25
0.15% C . . . . . 33.75 1.00% C . . . . . 33.00
2.00% C . . . . . 32.75
65.69% Cr, 4-9% C . . . . . 24.75
62-66% Cr, 4-6% C, 6-9% Si . . . . . 25.60

**S. M. Ferrocchrome**

Contract price, cents per pound, chrome-mium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
Carloads . . . . . 25.85
Ton lots . . . . . 28.00
Less ton lots . . . . . 29.50

**High-Nitrogen Ferrocchrome**

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrocchrome price schedule. Add 3¢ for each additional 0.25% of N.
--

**Chromium Metal**

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.
0.10% max. C . . . . . \$1.18
0.50% max. C . . . . . 1.14
9 to 11% C . . . . . 1.11

**Low Carbon Ferrocchrome Silicon**

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.
Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Contract price per lb of alloy, dump delivered.
30-33% Ca, 60-65% Si, 3.00% max. Fe
Carloads . . . . . 19.00
Ton lots . . . . . 22.10
Less ton lots . . . . . 23.60

**Calcium-Silicon**

Contract prices, cents per lb of alloy lump, delivered.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads . . . . . 20.00
Ton lots . . . . . 22.30
Less ton lots . . . . . 23.30

**CMSZ**

Contract price, cents per lb of alloy, delivered.
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
Ton lots . . . . . 20.75
Less ton lots . . . . . 22.00

**V Foundry Alloy**

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.
Ton lots . . . . . 17.50
Less ton lots . . . . . 19.50

**Graphidox No. 4**

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload packed . . . . . 18.00
Ton lots to carload packed . . . . . 19.00
Less ton lots . . . . . 20.50

**Ferromanganese**

78-82% Mn, maximum contract base price, gross ton, lump size.
F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O. . . . . \$225
F.o.b. Johnstown, Pa. . . . . 227
F.o.b. Sheridan, Pa. . . . . 225
F.o.b. Etna, Clairton, Pa. . . . . 228
F.o.b. Philo, Ohio . . . . . 225
Add \$2.80 for each 1% above 82% Mn, subtract \$2.80 for each 1% below 78% Mn.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk . . . . . 12.45
Ton lots, packed . . . . . 14.05

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**TRANSPORTATION EQUIPMENT**

**HOUSEHOLD APPLIANCES**

**ELECTRICAL EQUIPMENT**

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help you find your favorite features.

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IRON AGE ADS TOO!**

## Ferroalloy Prices

(Effective Apr. 21, 1953)

### Niobium

Contract prices gross ton; lump, f.o.b.	
16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Almerton, Pa. \$84.00	\$85.00
Almerton, Pa. or Chicago 84.00	85.00

### Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
0.6% min. Mn, 0.2% max. C, 1% max. 2.5% max. Fe.	
carloads, packed	36.95
ton lots	38.45

### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed	
base of Mississippi, cents per pound.	
carloads	30.00
ton lots	32.00
less ton lots	34.00 to 37.00
premium for hydrogen-removed metal	1.50

### Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.	
Carloads Ton Less	
0.7% max. C, 0.06%	
P. 90% Mn	28.45 30.30 31.50
0.7% max. C	27.95 29.80 31.00
1.5% max. C	27.45 29.30 30.50
3.0% max. C	26.95 28.80 30.00
5.0% max. C	26.45 28.30 29.50
7.5% max. C, 80-85%	
Mn, 5.0-7.0% Si	23.45 25.30 26.50

### Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per ton of contained Mn	
	21.35¢

### Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 3-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.	
Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carloads, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

### Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$95.50 gross ton, freight allowed to normal trade area.	
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N.Y., \$93.00. Add \$1.055 per ton for each additional 0.50% Si up to and including 17%. Add \$1.00 for each 0.50% Mn over 1%	

### Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
Si 2% Fe	18.00
Si 1% Fe	18.50

### Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.	
Carloads, bulk	6.95
Ton lots	8.55

### Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.	
25% Si	20.00
50% Si	12.40
80-85% Si	14.30 15.55 17.00

### Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast	Turnings
Ton lots ... \$2.05	\$2.95
Less ton lots 2.40	3.30
	4.55

### Ferrovandium

35-55% contract basis, delivered, per pound, contained V.	
Openhearth	\$3.00-\$3.10
Crucible	3.10-3.20
High speed steel (Primos)	3.20-3.25

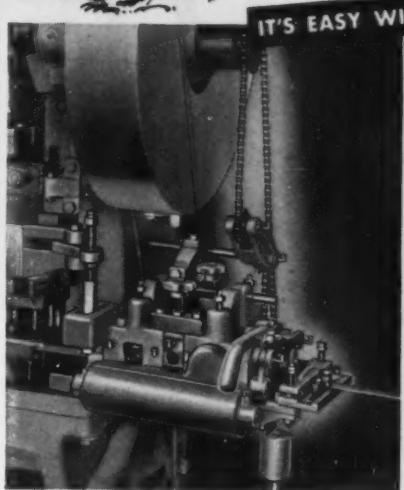
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Wittek automatic roll feeds fit all makes and sizes of punch presses—provide maximum efficiency and extreme accuracy in the high speed automatic feeding of strip stock. Made in single roll, double roll, and compound types with straighteners, in models to feed (push or pull) in any direction. Length of feed is easily adjusted to meet individual requirements.



### WITTEK Reel Stands

#### Simplify Handling of Coiled Stock

Choice of standard models to facilitate handling coiled stock . . . from small, light coils to those weighing up to 800 pounds. Larger reel stands automatically center the coils — provide frictional braking action to prevent overrunning, maintain uniform coil slack.

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## Why Lift Extra Tonnage?



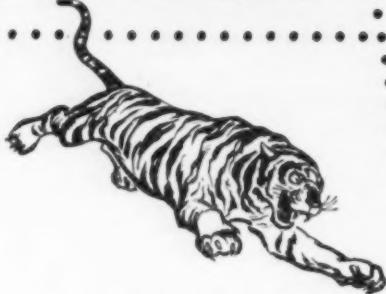
Walker Lifting Magnet operates with valuable saving of electrical energy . . . high ratio lifting magnet gives maximum lifting with minimum weight. Walker's advanced design insures more payload per lift . . . gets into corners . . . reduces supplementary hand work.

LESS WEIGHT—MORE POWER!

O. S. WALKER CO. INC.

WORCESTER 6, MASSACHUSETTS

Combines  
*Beauty*  
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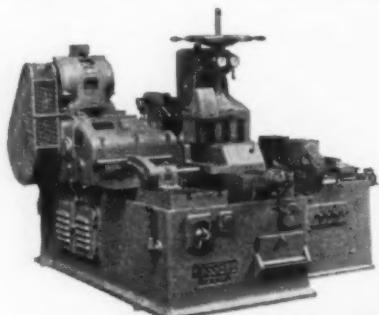
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Capacities: 3½" to 9½" rounds
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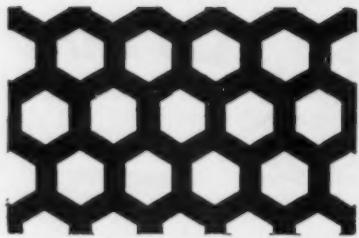
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A Chilton Publication



## Ferroalloy Prices

(Effective Apr. 31, 1953)

	TO
<b>Alisifer</b> , 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carloads	
Ton lots	\$3.90
Calcium molybdate, 46.3-46.6% f.o.b. Langeloeth, Pa., per pound contained Mo	\$1.20
<b>Ferrocolumbium</b> , 50-60% 2 in. x D contract basis, delivered per pound contained Cb	\$1.11
Ton lots	\$4.90
Less ton lots	\$4.90
<b>Ferro-Tantalum-Columbium</b> , 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$3.75
<b>Ferromolybdenum</b> , 55-75% f.o.b. Langeloeth, Pa., per pound contained Mo	\$1.11
<b>Ferrophosphorus</b> , electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$1.21
10 tons to less carload	\$65.00
<b>Ferrotitanium</b> , 40% regular grade, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$75.00
<b>Ferrotitanium</b> , 25%, low carbon, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.15
Less ton lots	\$1.15
<b>Ferrotitanium</b> , 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton	\$177.00
<b>Ferrotungsten</b> , ¾ x down, packed, per pound contained W, ton lots, f.o.b.	\$4.45
<b>Molybde oxide</b> , briquets or cans, per lb contained Mo, f.o.b. Langeloeth, Pa., bags, f.o.b. Washington, Pa., Langeloeth, Pa.	\$1.14
<b>Simanat</b> , 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	\$1.18
Carload, bulk lump	\$4.90
Ton lots, bulk lump	\$3.75
Less ton lots, lump	\$3.25
<b>Vanadium Pentoxide</b> , 86-89% V <sub>2</sub> O <sub>5</sub> contract basis, per pound contained V <sub>2</sub> O <sub>5</sub>	\$1.21
<b>Zirconium</b> , 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy	
Ton lots	\$1.00
<b>Zirconium</b> , 12-15%, contract basis, lump, delivered, per lb of alloy	
Carload, bulk	\$1.00
<b>Boron Agents</b>	
<b>Borsil</b> , contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B	\$1.25
<b>Bortam</b> , f.o.b. Niagara Falls	
Ton lots, per pound	\$1.25
Less ton lots, per pound	\$1.00
<b>Corbortam</b> , Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed	
Ton lots, per pound	\$10.00
<b>Ferroboron</b> , 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots, f.o.b. Wash., Pa.: 100 lb up	
10 to 14% B	\$1.20
14 to 16% B	\$1.20
19% min. B	\$1.20
<b>Grainal</b> , f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over	
No. 1	\$1.00
No. 6	\$1.00
No. 79	\$1.00
<b>Manganese - Boron</b> , 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	
Ton lots	\$1.48
Less ton lots	\$1.57
<b>Nickel - Boron</b> , 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered	
Less ton lots	\$1.20
<b>Silenz</b> , contract basis, delivered	
Ton lots	\$5.00

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STRIP STEEL

$\frac{1}{2}$ " to 19" Wide  
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April 23, 1953

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machine tool = FASTER, BETTER  
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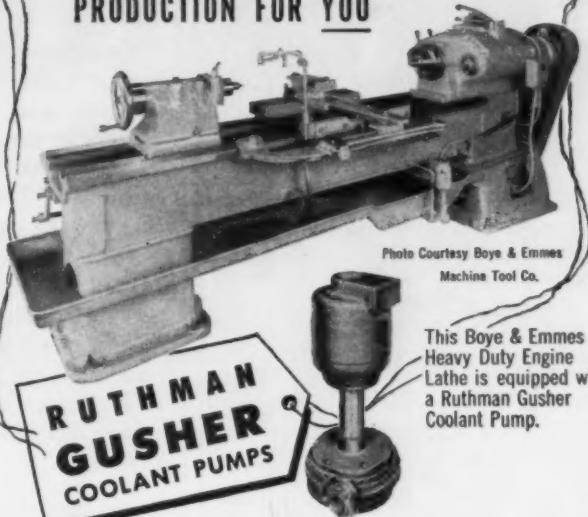


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1	2500	G.E.	MCF	600	400/500	
1	2500	Whse.	MIII	600	230/400	
1	2500	Whse.	QM	250	140/170	
1	2500	Whse.		250	450/550	
1	2500	Al. Ch.		250	400/800	
1	5000			550	115	
1	4500	Whse.	CC-218	600	300/800	
1	4500	G.E.	MCF	550	300/1050	
1	2500	Whse.	CB-5094	230	575/1150	
1	2500	G.E.	MPC	230	360/920	
1	200/250	Rel.	1970T	230	720	
1	300	Whse.	CB-5118	230	400/800	
1	150	Whse.	CB-3078	230	575/1150	
1	150	G.E.		600	250/750	
1	150	Cr. Wh.	65H	230	1150	
1	150	Cr. Wh.	82H-TEFC	230	900	
1	150	Whse.	HK-151B	230	900/1800	
1	150	Whse.	HK-201	230	360/950	
1	50/120	G.E.	MCF	230	250/1000	
1	100	Whse.	HK-181	230	450/1000	
1	100	G.E.	CDP-115	230	1750	
MILL & CRANE						
1	50	G.E.	CO-1810	230	725	
1	20	Whse.	K-5	230	975	
1	15	Whse.	K-5	230	630	
1	10	C.W.	SCM-AH	230	1150	
1	10	G.E.	MD-104	230	400/800	
1	6.25	Whse.	K-3	230	620	
1	5	C.W.	SCM-PP	230	1750	
1	3	Whse.	HK-2	230	835	
A.C. MOTORS						
3 phase—60 cycle						
SLIP RING						
Qu.	H.P.	Make	Type	Volts	Speed	
1	1800	G.E.	MT-498	2200	360	
1	1800	ABB		2300	720	
1	1200	G.E.	MF-24	2300	275	
1	1200	A.C.	MIII	2300	240	
1	2000	Whse.	CW	550	350	
1	2000	G.E.	IM	440	900	
1	2000	G.E.	MT-514-Y	6000	900	
1	600	Whse.	CW	440	914	
1	600	Whse.	CW-1218	2300	435	
1	350	G.E.	MT-442Y	2200/2400	235	
1	350	G.E.	MT-585Y	2200	910	
1	350	G.E.	MT-585Y	2200	910	
1	350	A.C.	S-Brg	440	845	
1	250	G.E.	MTP	440	1170	
1	250	G.E.	MT-434-Y	4000	257	
1	250	G.E.	MT-5598	2200	1800	
1	250	Al. Ch.		550	880	
1	200	Cr. Wh.	26QB	440	585	
1	200	G.E.	IM-17	440	800	
1	200	G.E.	IM	440	825	
1	200	G.E.	MTP	440	1170	
1	150 (unused)	Whse.	CW	2300	435	
1	150	G.E.	IM-18	440	800	
1	120	A.C.		440	845	
1	120	Al. Ch.		440	720	
1	120	G.E.	MT-585Y	440/2200	435	
1	100	G.E.	IM	440	800	
1	100	A.C.	ANT	440	825	
1	100	G.E.	IM-16	2200	435	
1	100	Whse.	CW-368A	440	700	
SQUIRREL CAGE						
2	850	G.E.	FT-559BY	440	8570	
2	450	Whse.	CS-1420	2200/4150	854	
1	200	G.E.	IR-17	440	580	
1	200	G.E.	IK	440	805	
1	200	G.E.	IT-557	440	1800	
1	150	Whse.	CS-854B	440	1800	
1	150	Whse.	CW	440	580	
1	150/75	G.E.	IK	440	900/150	
1	125	Al. Ch.	ARW	2200	1750	
1	125	G.E.	KF-6328-Z	440/2200	825	
1	125	Whse.	MR	440	485	
SYNCHRONOUS						
2	2500	G.E.	TS	2200	257	
2	2100	G.E.	ATI	2200	820	
2	1750	G.E.	ATI	2200	820	
2	2000	Whse.	ATI	2200	150	
2	750	G.E.	ATI	2200/12000	800	
1	450	Whse.	ATI	2200	450	
2	350	G.E.	TS	2200	150	
M-C Sets — 3 Ph. 60 Cy.						
Qu.	K.W.	Make	D.C.	A.C.	Volts	
1	2000	G.E.	500	600	11000	
1	2000	G.E.	514	600	6000/13200	
3	1500	G.E.	514	550	6000/13200	
1	1500	G.E.	730	600	6000/13200	
1	1500	G.E.	388	375	4400	
1	1500	G.E.	600	600	4140	
1	1500	G.E.	514	115	4000/13200	
2	1800	Whse.	900	900	4160	
1	1000 (SU)	G.E.	900	260	8600	
1	750	Whse.	900	250	3200	
1	750	C.W.	514	115	2200	
1	600	G.E.	720	320	440/2300	
1	500	G.E.	730	125	4000/13200	
1	500	Whse.	900	125/250	440	
1	500	Whse.	900	250	6000/13200	
1	500	Whse.	1200	250	3200	
1	400	Whse.	1200	275	3200	
1	400 (SU)	Cr. Wh.	1200	125/250	440/2300	
1	150	Whse.	1200	275	3200	
1	100	Delsco	1200	130/260	3200	
1	100	G.E.	1170	125	220/440	
FREQUENCY CHANGER SETS						
Qu.	KW.	Make	Free.	Voltages		
1	3500	G.E.	35/60	2200/2300/4000		
2	2500	G.E.	25/62.5	2200/2300		
1	1000	G.E.	25/58.3	4400/2200		
1	500	Al. Ch.	2500	11000/2200		

**BELYEA COMPANY, INC.**  
47 Howell Street, Jersey City 6, N. J.

Cuts Sales . . . Government lending of machine tools to contract winners was being criticized by dealers in the Pittsburgh area this week. When Uncle Sam lends equipment it usually means a lost sale for the dealer.

This has happened too often, Pittsburgh dealers believe, and there is considerable resentment against the practice. Naturally the contractor is more than pleased with the arrangement because it saves him the purchase price of a machine.

**OPS Effects Linger . . .** Some dealers are also burning about the hangover effect old Office of Price Stabilization price lists have on potential deals to buy all the machinery in a plant. By purchasing all the machinery in a plant a dealer was formerly able to make a fair profit by selling the desirable equipment at good prices, while getting rid of the mediocre machinery at a smaller profit.

But as a result of OPS, plant owners are now more aware of the value of their good equipment and frequently sell it directly to users, leaving the dealer cats and dogs to get rid of.

**Dealers Get By . . .** Used machinery business in the area is generally spotty, though activity in steel mill equipment is strong. Dealers give the impression that while they are far from satisfied with the current business pace, they are still making enough to keep the wolf away.

One dealer recently disposed of a 7½-ton soaking pit crane to a Mexican steel plant. It was also reported that a heavy ladle crane was sold to the same company.

Inquiries are reported to be plentiful, but only a small percentage of them result in a deal.

**Crane Trade Lags . . .** Crane dealers say business is slow. Better deliveries on new equipment, particularly the lighter types of floor-controlled units, are making

competition stiffer. One manufacturer is reported to be offering new cranes in this class for delivery in 3 weeks.

Electrical business has picked up. The steel mills and industry generally are buying again, ending the temporary slump in demand.

**In-plant Rebuilding . . .** Boeing Airplane Co. reports its machine tool rebuilding department, established in 1949 at the company's Wichita, Kan., division, reworked 144 machines last year. Cost of servicing each machine was estimated at an average of 20 pct of 1942 list price.

The company started its rebuilding program shortly after opening its World War II B-29 Superfortress plant at Wichita, which was reactivated for production of B-47 Stratojets. Unable to get new tools and not being able to wait for outside rebuilding, Boeing started its own program.

It takes the company about 30 days to completely rework a machine tool. To restore the ways on machinery, Boeing uses phenolic, a resin-base absorbent plastic, after the way surfaces have been scraped. The company reports that phenolic strips on the ways drastically limit defacing from metal chips.

**Sell Surplus Tools . . .** Air Force recently sold 228 surplus machine tools at Government Aircraft Plant No. 6, Marietta, Ga., for \$215,000.

The tools were offered to the public after they had been screened by both the military and government agencies. Some of them were missing parts and the majority were termed obsolete.

There are still 2500 tools to be screened and offered for sale. Air Materials Command officials expect that 500 of these will be taken up in the screening process, leaving 1500 to be sold at Marietta, and another 500 at Omaha, Neb. These sales may not be held for another year, however, because of the lengthy screening process.